REPORT RESUMES

ED 018 551 VT 000 895

THE STATUS OF AND NEED FOR INDUSTRIAL EDUCATION IN THE PUBLIC SECONDARY SCHOOLS IN UTAH, A SPECIAL INDUSTRIAL EDUCATION RESEARCH PROJECT.

BY- BARTEL, CARL R. LOVELESS, AUSTIN G.

UTAH STATE BOARD OF EDUCATION, SALT LAKE CITY

PUB DATE JUN 66

EDRS PRICE MF-$0.75 HC-$6.56 162P.

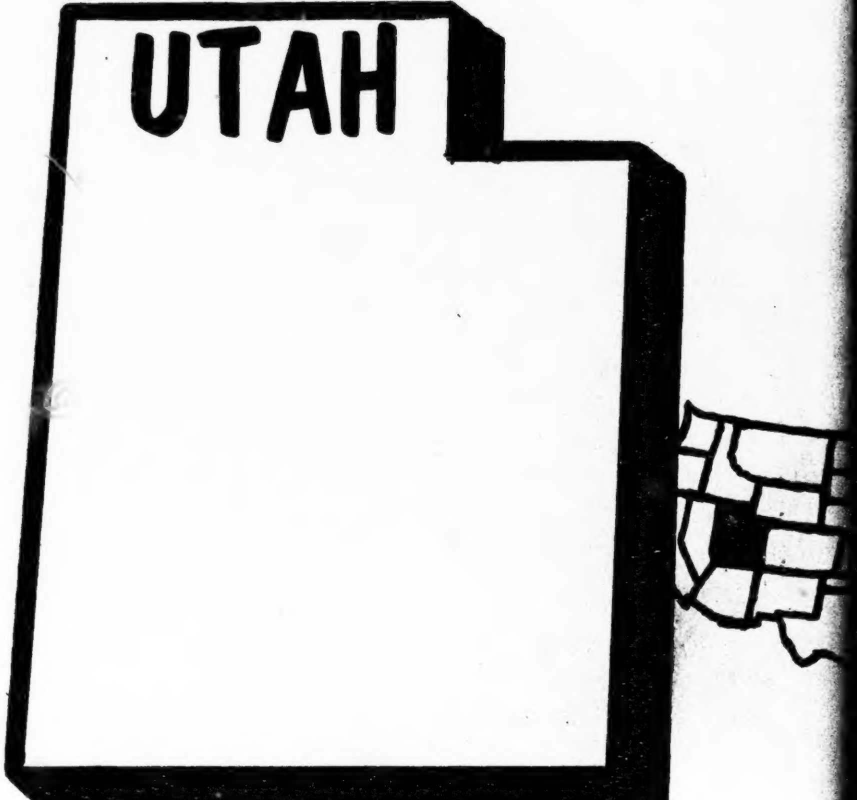
DESCRIPTORS- *INDUSTRIAL EDUCATION, STUDENT OPINION, *SCHOOL SURVEYS, SURVEYS, HIGH SCHOOLS, *PROGRAM ATTITUDES, EMPLOYER ATTITUDES, PARENT ATTITUDES, TEACHER ATTITUDES, ADMINISTRATOR ATTITUDES, COUNSELORS, *INDUSTRIAL ARTS, *TRADE AND INDUSTRIAL EDUCATION, PROGRAM EVALUATION, TEACHER QUALIFICATIONS, UTAH,

TO ASCERTAIN THE PRESENT STATUS OF AND THE NEED FOR INDUSTRIAL EDUCATION IN THE 40 SCHOOL DISTRICTS IN UTAH, DATA WERE OBTAINED DURING THE 1964-65 SCHOOL YEAR FROM ALL EXCEPT THE MURRAY DISTRICT. INTERVIEWS AND QUESTIONNAIRES WERE USED TO COLLECT DATA FROM 81 JUNIOR HIGH SCHOOLS AND 74 SENIOR HIGH SCHOOLS WITHOUT TRADE AND INDUSTRIAL PROGRAMS, 20 SENIOR HIGH SCHOOLS WITH SUCH PROGRAMS, 1,032 PARENTS OF JUNIOR HIGH INDUSTRIAL ARTS STUDENTS, 1,304 PARENTS OF SENIOR HIGH INDUSTRIAL ARTS STUDENTS, 168 PARENTS OF TRADE AND INDUSTRIAL STUDENTS, 1,289 JUNIOR HIGH INDUSTRIAL ARTS STUDENTS, 1,729 SENIOR HIGH INDUSTRIAL ARTS STUDENTS, 362 TRADE AND INDUSTRIAL STUDENTS, 129 JUNIOR HIGH INDUSTRIAL ARTS TEACHERS, 183 SENIOR HIGH INDUSTRIAL ARTS TEACHERS, 28 TRADE AND INDUSTRIAL TEACHERS, PLUS A NUMBER OF PARENTS AND STUDENTS IN A SPECIAL VOCATIONAL PROGRAM. SOME TYPE OF INDUSTRIAL ARTS OFFERING IS AVAILABLE IN ALL SECONDARY SCHOOLS IN THE 40 DISTRICTS. THIRTY-EIGHT TRADE AND INDUSTRIAL COURSES WERE OFFERED IN 13 SCHOOL DISTRICTS. OF THE 38 COURSES, 15 WERE AUTO MECHANICS. OTHER SUBJECTS TAUGHT WERE CARPENTRY, DRAFTING, MACHINE SHOP, WELDING, ELECTRONICS, VOCATIONAL METALS, AUTO BODY, AND MEAT CUTTING. RECOMMENDATIONS INCLUDE--(1) THE PURPOSES AND OBJECTIVES OF INDUSTRIAL ARTS AND TRADE AND INDUSTRIAL PROGRAMS MUST BE MORE ADEQUATELY STATED AND DISSEMINATED, (2) INDUSTRIAL ARTS COURSES SHOULD BE A PREREQUISITE TO ALL TRADE AND INDUSTRIAL COURSES OFFERED IN THE HIGH SCHOOL, AND (3) A MORE CONCERTED EFFORT MUST BE MADE IN DEVELOPING, COORDINATING, AND USING ADEQUATE COURSES OF STUDY. DATA ARE INCLUDED FOR ALL ASPECTS OF THE STUDY IN 113 TABLES. (EM)

895

RESEARCH REPORT
UTAH STATE BOARD OF EDUCATION

the STATUS of and NEED for INDUSTRIAL EDUCATION in the public SECONDARY SCHOOLS in UTAH



1964 - 1965

ED018551
VT000895

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

THE STATUS OF AND NEED FOR INDUSTRIAL EDUCATION IN THE PUBLIC SECONDARY SCHOOLS IN UTAH

A Special Industrial Education Research Project
conducted for the Research Division, Utah State
Board of Education

Directors of the Study: Dr. Carl R. Bartel
Chairman and Professor
Industrial and Technical Education Dept.
Utah State University

Dr. Austin G. Loveless
Research Specialist and Professor
Industrial and Technical Education Dept.
Utah State University

Office of the State Superintendent of Public Instruction
T. H. Bell, Superintendent

Walter D. Talbot, Deputy Superintendent for Administration
Maurice C. Barnett, Administrator, Division of Research & Planning
Mark Nichols, Administrator, Vocational and Technical Education
Ianthus Wright, Specialist, Curriculum Research

June 1966

ACKNOWLEDGMENTS

The directors of this study wish to extend their appreciation to the people and organizations whose assistance enabled them to conduct this study.

First, to the administrators and teachers of the 39 school districts that cooperated in this study.

Second, to the students and their parents who were kind enough to take time to complete the questionaire that provide most of the data for this study.

Next to the personnel officers in industry that took time from their busy schedules to complete the questionaire.

Special thanks to Mr. Kenneth Densley and Albert Perreault in helping collect the data.

TABLE OF CONTENTS

INRODUCTION 1

Purpose of the Study 2
Source of Data 3
Procedure 6
Limitations 7
Definitions 7

INDUSTRIAL ARTS PROGRAMS 10

Opinions of Students 10
Opinions of Parents 24
Opinions of Teachers 32
Opinions of Administrators and Counselors 35
Opinions of Industrial Management 52

TRADE AND INDUSTRY PROGRAMS 55

Opinions of Students 55
Opinions of Parents 88
Opinions of Administrators 98
Opinions of Industrial Management 101

TRADE AND INDUSTRIAL PROGRAM EVALUATION 116

TEACHER QUALIFICATIONS 133

SUMMARY 134

Program Offerings and Future Plans 134
Objectives 135
Value of Industrial Education Programs 137
Reasons Students Select Industrial Education Courses 139
Program Effectiveness in meeting Students Needs 140
Physical Facilities 142
Relationship of Program to Anticipated Employment 143
Selection of Students for Programs 145

RECOMMENDATIONS 147

LIST OF TABLES

Table Page

1. Students' opinions of values received from industrial arts courses 10

2. Degree of student's satisfaction with industrial arts courses 12

3. Students' opinions of their shop facilities and equipment 13

4. Students' opinions of the purpose of industrial arts 15

5. Reasons given by students for registering for industrial arts courses 16

6. Parents' attitude toward students registering for industrial arts courses 17

7. Students' opinions on whether or not science and industrial arts teachers work together providing opportunities for application of scientific principles 18

8. Students' responses to question of which type of person would benefit most from industrial arts 19

9. Students' judgement of the occupational group receiving the most value from industrial arts. 20

10. Value of industrial arts courses to future employment or schooling . . . 21

11. Trade and industrial classes desired by students who are now enrolled in industrial arts courses 22

12. Use of industrial art laboratory facilities for school activities 23

13. Areas in which parents thought industrial arts was of most value . . . 24

14. Parents' judgement of student type benefitting most from an industrial arts program 25

15. Occupational areas that industrial arts activities contribute to most 26

16. Attitude of parents toward their sons taking industrial arts 27

Table Page

17. Opportunity to apply information received in industrial arts in other courses 27

18. Industrial arts could be improved by cooperating with other courses--parents' opinions 28

19. Ways the industrial arts program may be improved 29

20. Parents responses pertaining to the physical quality of the industrial arts shop and equipment 30

21. Parents interested in son taking a trade and industrial course if available 30

22. Occupational area parents would prefer their son be enrolled in if trade and industrial courses were available in high school 31

23. Anticipated plans of parents for their son after high school graduation 32

24. Degree of emphasis that should be placed on the purposes of industrial arts according to teachers 33

25. Reasons administrators placed students in industrial arts classes as seen by industrial arts teachers 34

26. Attitude of administrators toward industrial arts program as seen by the industrial arts teachers 35

27. Importance of industrial arts objectives in the opinion of administrators and counselors 37

28. Accomplishment of the objectives by the schools 39

29. Value of industrial arts to various occupational groups 40

30. Why students are placed in industrial arts courses 41

31. Should there be a correlation between work in the sciences and industrial arts. 42

32. Type of students who will benefit most from the industrial education program 42

33. Reasons offerings which should be made are not being made at present 44

Table Page

34. Reasons students take industrial arts according to administrators and counselors 46

35. Importance of industrial arts and trade and industrial education to high school graduates 47

36. Industrial education shop should be open for students working on special school projects 48

37. Reasons trade and industrial courses are not offered in various areas 49

38. Trade and industrial programs should include actual on-the-job work time in cooperation with local industry 50

39. Public schools responsible for adult education programs to provide industrial retraining 51

40. Adult industrial retraining programs considered best by administrators and counselors 51

41. Importance of industrial arts objectives and how well the objectives are being achieved according to industrial management 53

42. Ranking of industrial arts areas by industrial management 54

43. Desirability of occupations in the opinions of students 57

44. The main purpose of the trade and industrial program 58

45. The quality of the trade and industrial program in meeting the needs of students in getting and/or holding a job 60

46. Statements regarding instruction pertaining to information presented in courses 62

47. Primary reasons students enroll in trade and industrial programs 64

48. Secondary reasons students enroll in trade and industrial programs 65

49. What parents thought about their sons' enrollment in a trade and industrial course 66

50. Student's plans for the first two years following graduation 67

51. Opinions of carpentry shop students concerning physical conditions of facilities and equipment 70

Table Page

52. Opinions of auto mechanics shop students concerning physical conditions of facilities and equipment 71

53. Opinions of drafting shop students concerning physical conditions of facilities and equipment 72

54. Opinions of machine shop students concerning physical conditions of facilities and equipment 73

55. Opinions of welding shop students concerning physical conditions of facilities and equipment 74

56. Opinions of electronics shop students concerning physical conditions of facilities and equipment 75

57. Opinions of vocational metals shop students concerning physical conditions of facilities and equipment 76

58. Opinions of auto body shop students concerning physical conditions of facilities and equipment 77

59. Value of industrial arts courses completed by carpentry trade and industrial students 78

60. Value of industrial arts courses completed by auto mechanics trade and industrial students 79

61. Value of industrial arts courses completed by drafting trade and industrial students 80

62. Value of industrial arts courses completed by machine shop trade and industrial students 81

63. Value of industrial arts courses completed by welding and industrial students 82

64. Value of industrial arts courses completed by electronics trade and industrial students 83

65. Value of industrial arts courses completed by vocational metals trade and industrial students 84

66. Value of industrial arts courses completed by auto body trade and industrial students 85

67. Contribution industrial arts instruction made of most value to students 86

Table Page

68. Trade and industrial students enrolled simultaneously in industrial arts courses 87

69. Industrial arts courses taken concurrently with a trade and industrial course. 88

70. Occupational area desired by parents for their sons 89

71. What type of student benefits most from trade and industrial education 90

72. Trade and industrial instruction of most value to students 91

73. Trade and industrial instruction is of a practical nature for employment 91

74. Knowledge that the trade and industrial program is providing for the student 92

75. Responsibility of the public school in reference to the training of workers for industry 93

76. Activities of students during the first two years after graduation 94

77. Necessary improvement in the quality of trade and industrial instruction 95

78. Physical quality of the trade and industrial facilities 96

79. Opportunities in trade and industrial areas to students 97

80. The purpose of trade and industrial education 99

81. Administrator's opinions as to what students of trade and industrial programs do the first two years after graduation 99

82. Methods of selecting students for trade and industrial courses 100

83. Reasons students register for trade and industrial courses in the opinion of administrators 101

84. Opinions of industrial management concerning the purpose of trade and industrial programs in high schools 102

85. Anticipated industrial changes and the effect on trade and industrial curriculum 103

Table Page

86. Where emphasis should be placed in high school trade and industrial education according to industrial management people 103

87. Public school's responsibility for providing trade and industrial education in high school 104

88. Areas in which industrial managements thought schools should provide trade and industrial programs on the high school level 104

89. High school trade and industrial program as preparatory or terminal education 105

90. Opinions of industrial management concerning "cooperation on-the-job work time 105

91. Equipment and facilities that industrial management thought should be provided for trade and industrial education programs in high school 106

92. Opinions of industrial managements concerning areas that should be stressed in trade and industrial education at high school for the student to be able to enter into employment 107

93. Opinions of industrial management concerning adequate trade and industrial education programs in meeting the needs of students in getting jobs 109

94. Opinions of industrial management concerning how students should be selected for trade and industrial classes 110

95. Opinions of industrial management concerning public high schools providing adult retraining programs 110

96. Adult industrial retraining programs considered to be best by industrial management 111

97. New trade and industrial courses industrial management thought the high schools should introduce into the curriculum 112

98. Education required by industrial managers for entry into selected trades 113

99. Opinions of industrial managers concerning hiring personnel 114

100. Opinions of industrial managers concerning hiring personnel 115

Table Page

101. Advisory committees 116

102. Continuing needs of the training program 118

103. Program improvement relating to course objective and content 119

104. General physical provisions 120

105. Instructional physical provisions 122

106. Instructional methods and management 124

107. Instructional and other special conditions or provisions for shop or laboratory courses 125

108. Special shop or laboratory conditions or provisions related to arrangement of equipment, safety, and health 127

109. Special conditions and provisions relating to students and activities in secondary schools 128

110. Vocational supervisory staff 130

111. Determining community needs for training programs 130

112. Trade and industrial teachers opinion of the support of vocational programs by school administrations 132

113. Industrial experience of trade and industrial teachers 133

THE STATUS AND NEED FOR INDUSTRIAL EDUCATION IN THE PUBLIC SECONDARY SCHOOLS IN UTAH

INTRODUCTION

There is in the United States an increasing awareness of public responsibility for the economic and social well being of all the American people. This is attested to by the many laws and acts being passed and by programs promoted by federal, state, and private organizations for minority and other groups with special needs.

Education may be seen as one of the greatest tools in the fight to strengthen America. Education has in varying degrees appeared as a luxury to various people of the world and has, to a great extent, been reserved for a select few. However, we in this country have progressively taken steps to provide educational opportunities for all people with equal consideration.

In recent years we have become more aware of the gap that exists between theory and practice. More nearly adequate education programs must be provided to help bridge this gap. Industrial education, a part of the total educational program, will not only help to bring theory and practice closer together, but in so doing will play an increasingly important part in aiding this country's efforts to become an even stronger world power. In the United States, fewer opportunities are available each year for those who qualify for only unskilled or semi-skilled jobs. Industrial education must accept the challenge of meeting the need for training and re-training programs to provide usable skills for the unemployable and underemployed.

The secondary school has an important part to play in planning, developing and/or expanding its industrial education offerings to assist in filling this nation's need for occupational training for increasing the enjoyment of its citizens through a better understanding of our technological culture, and to strengthen our national defenses. A knowledge of the present status of the industrial education programs in the public secondary schools of Utah would help provide a "taking-off-point" for sound planning of future programs.

The rapidly changing industrial and technological scene requires an extreme alertness on the part of industrial educators. Future planning must involve the interests and needs of students, parents, school administrators, industrial workers, and industrial management.

Purpose of the Study

The purpose of this study is to ascertain the present status of and need for industrial education in the forty school districts of Utah. Answers to the following questions were sought:

1. To what extend and at what levels is the industrial education program now being offered? What type of organizational pattern is presently in operation in the public schools of Utah?

2. What content areas are included in the industrial education programs and to what extent is each area being offered? What new or expanded content areas are now being planned?

3. What are the major purposes of industrial education according to students, teachers, and administrators engaged in the program; and according to parents and management who are concerned with students who complete such programs?

4. What discernible factors influence students to select industrial education courses, and on what basis are students placed in industrial education courses?

5. What is the nature and type of physical facilities now in use, and to what extent are these facilities being utilized. What are the plans for improvement and/or expansion of existing industrial education facilities?

6. What is the education and occupational preparation of instructors of industrial courses; and what characteristics, if any, typify industrial education instructors?

7. What is the attitude of parents toward industrial education programs, and to what extent do parents exhibit this attitude by parental control over their children?

8. What are the administrators' levels of understanding about the purposes and types of industrial education programs? What interest do they take in the placement of students, and the operation and expansion of programs?

Source of Data

Data were obtained during the 1964-65 school year from all of the forty school districts in Utah with the exception of Murray School District. All public secondary schools in the 39 districts contributed some data; however, some schools failed to return a portion of the requested data.

Instruments were received from 81 junior high school administrators, 74 senior high school administrators without trade and industrial programs and 20 senior high school administrators in schools with trade and industrial programs.

Parents' questionnaires were returned by 1032 parents of junior high school industrial arts students, 1304 parents of senior high school industrial arts students, and 168 parents of trade and industrial students.

Questionnaires were completed by 1289 junior high school and 1729 senior high school students of industrial arts, and 362 trade and industrial students. Industrial arts teachers at the junior high school level provided data numbered 129, while 183 senior high industrial arts teachers and 28 trade and industrial teachers contributed to the study.

Parent and student data were also obtained from the secondary school students of Carbon High School who were receiving vocational training at the College of Eastern Utah. Questionnaires were also sent to various representatives of labor and industrial management. The response from labor, however, was too small to be included as a part of this study.

The following questionnaires and interview forms were designed to collect the desired data.

Questionnaire for students in industrial arts

This questionnaire was administered to 12 students in one of the classes taught by each junior and senior high school industrial arts teacher in the state of Utah. Every other student was selected from a class roll on which their names were listed alphabetically, beginning with the second name or even numbered student.

Questionnaire for parents of industrial arts students

The instrument was taken home to 12 selected parents of students enrolled in each class. The students who took the instrument home to their parents were the odd numbered students on the class rolls. Parents completing the instrument did not have children completing the student instrument. This was done to reduce the possibility of student influence in completion of the parent instrument.

Questionnaire for teachers of industrial arts

Information from the teachers of industrial arts was obtained by questionnaires through a cooperative effort with the Utah State Specialist in Industrial Arts.

Questionnaire for supervisors, principals, and guidance personnel in reference to industrial education courses

Two instruments were taken to each secondary school. One was to be completed by either a principal or assistant principal and the other by one of the guidance personnel.

Questionnaire for trade and industrial students

These instruments were completed by all trade and industrial students who were in attendance the day the questionnaires were handed out. The same students took questionnaires home to their parents. In addition to the administration of the questionnaire as listed above, an additional section consisting of two pages pertaining to trade and industrial programs were added to instruments going to schools where trade and industrial programs existed.

Interviews for teachers of trade and industrial programs

An interview was conducted with each teacher of trade and industrial programs because of the nature of the instrument.

Questionnaire for members of industrial management

This instrument was completed by men who were in the field of industrial management. Instruments were sent to each personnel officer of the companies who held membership in the Utah Personnel Association.

Procedure

Beginning in the summer of 1964, the questionnaires were prepared and distributed to various interested persons for recommmendations and revisions. The instruments were reviewed by various industrial and technical education personnel as well as by state department officials.

The instruments were then administered to pilot groups for the purpose of identifying areas requiring revisions. Initially, the revised instruments pertaining to industrial arts were distributed in district level meetings held by the State Specialist for Industrial Arts Education. The instruments were explained and instructions were given to all teachers of the districts who were in attendance at the meetings. The teachers were provided with envelopes which were self-addressed and stamped for ease in returning the completed instruments.

To improve results, several changes were made in the method of distributing the instruments. Many instruments were hand carried to each school where the principal was contacted and arrangements made for the distribution of the questionnaires. Completed questionnaires were picked up at the schools approximately ten days later. The ten day time period for the completion of the questionnaires was selected to allow adequate time for completion by busy administrators. It was believed that a longer period would be abused, leading to some losses because of misplacement of the material.

Information pertaining to the Trade and Industrial Education program was obtained through personal interviews with the teachers and from observation of class activities and physical conditions in the shop.

The industrial management instruments were distributed and returned by mail.

All data obtained were analyzed and tabulated at Utah State University.

Limitations

All data were obtained within the geographical boundaries of the State of Utah.

Students questionnaires were only administered to secondary students in Utah's public schools. Twelve students from one class were selected by each industrial arts teacher to complete the student questionnaires. Twelve different industrial arts students from the selected class took instruments home for their parents to complete and return.

Industrial education teacher instruments were incorporated in an instrument prepared and distributed by the State Industrial Arts Specialist.

Trade and industrial student instruments were completed by students who were enrolled in three-hour trade and industrial programs of public schools during the entire 1964-65 school year.

Trade and industrial parent instruments were limited to parents with sons who met the above requirements.

Only trade and industrial programs which met three hours per day during the entire 1964-65 school year were evaluated.

Management instruments were limited to personnel officers of each company holding membership in the Utah Personnel Association.

Definitions

Vocational Education: An integral part of the total educational program. It is designed to develop skills, technical knowledge, understandings, work habits, and appreciations needed by workers to enter and make progress in socially acceptable employment on a useful and productive basis.

Industrial Education: A type of education that includes all educational activities dealing with and related to modern industry. It concerns itself with the study of tools, materials, products, processes, and problems of industry. It includes the programs of industrial arts education, trade and industrial education, and technical education.

Practical Arts: A type of functional education predominantly manipulative in nature which provides learning experiences in leisure-time interests, consumer knowledge, creative expression, family living, manual skills, technological development, and similar outcomes of value to all.

Industrial Arts: A phase of practical arts education which functions as both general and specialized education. It involves the study and use of tools, materials, and products of modern industry. It emphasizes the development of basic skills and technical knowledge. It is non-vocational in nature and objective and serves exploratory and pre-vocational interests.

Trade and Industrial Education: A phase of vocational education, which emphasizes the development of trade and industrial skills, safety judgment, and technical knowledge required by industry so that students may be adequately prepared to enter and/or advance in trade and industrial occupations. It is vocational in nature and objective.

Shop: A type of industrial education facility used at the secondary school level, grades seven through twelve. Examples of such a facility are wood shops, metal shops, and automotive shops.

Program or Field: A unit used for subject matter grouping such as industrial arts, trade and industrial, technical education, science, English, or social science.

Area: A major segment of a field or program (industrial arts, trade and industrial, or technical education), which includes areas such as drafting, metals, woods, and electricity-electronics.

Sub-Area: A major part included within a given area. The area of metals includes the sub-areas of welding, sheet metal, machine, and casting. One of the sub-areas may become the title of a course and given major emphasis.

Junior High: Secondary school grades 7-9.

Senior High: Secondary school grades 10-12.

Weighted Number: As used in this report, weighted number is obtained by multiplying first choice items by three, second choice items by two, and third choice items by one. The products are then summed to provide the weighted number.

INDUSTRIAL ARTS PROGRAMS

Opinions of Students

The first question asked of students pertained to four industrial arts objectives. Students were asked whether the industrial arts course they took met their needs as they saw them when they registered for the course. Table 1 supplies date received from students of junior and senior high school industrial arts programs in the state of Utah.

Table 1. Students' opinions of values received from industrial arts courses

	Met Most Needs		Met Some Needs		Met Few Needs		No Response	
Objectives	Jr.	Sr.	Jr.	Sr.	Jr.	Sr.	Jr.	Sr.
	Percentage							
Manipulative skill (such as how to use hand tools and machines)	89	86	8	11	3	3	0	0
Information about industrial processes (such as how products are produced)	63	65	23	22	13	11	1	2
Information about industrial materials (such as how steel and plastic are manufactured)	53	47	24	23	22	27	1	3
Information about occupational opportunities (such as what jobs are available, training required for different jobs)	54	57	25	22	21	20	0	1

The results shown in Table 1 indicate that students believed their needs in the manipulative skill area were well met by the program. Eighty-nine per cent of the junior high school students believed the program met most or all of their needs within this category. The senior high school response was nearly as high with 86 per cent in the same category. Both junior and senior high school groups contained only 3 per cent who thought that few of their needs were met concerning manipulative skill.

In the junior high school, 63 per cent believed the program met all or most of their needs in the area of processes. In the senior high school, the figure was slightly higher with 65 per cent in the "met most" column. There were approximately four times as many junior and senior high school students who believed the industrial arts program only met a few of their needs in the area of industrial processes as compared to manipulative skill.

The students believed that of the four objectives, the one providing information about industrial materials met their needs least. Only 53 per cent of the junior high school and 47 per cent of the senior high school students responding to this question indicated "most" of their needs were met. This objective, pertaining to materials, received the greatest number of marks in the column indicating that "few" of their needs were met. The per cents were 22 and 27 for the junior high school and senior high school students, respectively.

In the opinion of students, information about occupational opportunities was the objective which was the second lowest as far as meeting their needs.

The next question was designed to find out how well students were satisfied with their industrial arts courses in six different areas. Students were asked to select a first, second, and third choice from the list of objectives. Table 2 shows the rank order of how the students responded to these six area of the industrial arts program.

Table 2. Degree of student's satisfaction with industrial arts courses

Course Areas	Rank		Weighted Number	
	Jr.	Sr.	Jr.	Sr.
Making projects	1	1	253	239
Providing an opportunity to experiment with materials and processes	2	2	231	227
Development of a hobby	3	3	214	219
Preparing for an occupation	4	4	203	215
Help in selection of an occupation	5	5	201	206
Provided an opportunity to apply facts learned in other classes; such as, physics, chemistry, and biology	6	6	176	177

The area ranking last for both junior and senior high school students was in providing an opportunity for applying scientific principles. Students of the junior and senior high school were most satisfied in the area of "making projects." Junior and senior high school students were in agreement as the ranking for each was the same.

Students were asked to respond to 21 statements concerning the physical status of the shop, class, tools, and equipment. Table 3 lists the statements and responses of the opinions of both junior and senior high school students.

Table 3. Students' opinions of their shop facilities and equipment

	Good		Fair		Poor		No Response	
	Percentages							
Areas	Jr.	Sr.	Jr.	Sr.	Jr.	Sr.	Jr.	Sr.
a. Adequate shop space	77	69	18	19	4	10	1	2
b. Adequate class space	76	75	16	15	7	9	1	1
c. Adequate work benches	76	65	15	24	8	10	1	1
d. Adequate class desks	67	73	18	14	11	11	4	2
e. Number of hand tools	76	70	16	21	7	7	1	1
f. Quality of hand tools	78	76	17	17	4	5	1	2
g. Amount of power tools and equipment	77	69	17	18	6	7	0	6
h. Condition of power tools and equipment	85	75	12	13	3	6	0	6
i. Lighting	85	83	8	12	6	5	1	0
j. Wall outlets	74	70	18	18	7	9	1	3
k. Dust removal	55	53	22	22	21	21	2	4
l. Proper ventilation (such as fans for welding)	60	60	19	19	19	16	2	5
m. House keeping	75	71	19	20	5	7	1	2
n. Test equipment	52	56	24	19	18	16	6	9
o. Facilities for movies and film strips	41	43	24	23	33	31	2	3
p. Blackboard space	62	66	24	23	13	10	1	1
q. Lighting on blackboard	63	70	22	19	13	9	2	2
r. Storage areas								
1. for projects	59	46	21	26	19	26	1	2
2. for material	69	60	21	24	8	16	2	0
3. for tools	85	76	10	16	5	6	0	2
s. Adequate safety devices, rule and regulations	85	82	10	12	2	3	3	3

As a group the junior high school students considered the "condition of power tools and equipment" as the best from the list of 21 items. The second highest item was "storage for tools." Safety and lighting rated positions three and four, respectively. At the low end of the list or the item receiving the least response was "facilities for movie and film strips." Other items which were considered by the junior high students to be low in quality included ventilation, storage for projects, dust removal, and test equipment.

It is interesting to note the similarity in the opinions of the junior high responses and those of the senior high. Lighting was rated highest by the students. Other high items were "safety" and "storage for tools." At the low end of both lists were: "ventilation," "dust removal," "facilities for movies and film strips," "storage for projects," and "test equipment."

Students were also asked to give three reasons industrial arts was taught, selecting the items in order of preference.

A list of reasons for offering industrial arts was provided for ease in answering and compiling data. A line labeled "other" was added for responses not listed. Each student checked three reasons in rank order of importance. Table 4 shows the rank of each of the 12 purposes which were given by both junior and senior high students. Both the junior and senior high students ranked selection of an occupation field and learning to use power equipment and other machines as first and second, respectively. There were 48 total "other" responses from junior high students which represented only 3.5 per cent of the total group. Similar responses were grouped and totaled. None of the junior high "other" responses reached the one per cent level.

There were 104 responses by senior high students in the "other" space which amounted to six per cent. The 104 responses were distributed over 23 different statements.

Students who were not in a required course were asked to select three items, in descending order of importance, which influenced their decision to take industrial arts.

Table 4. Students' opinions of the purpose of industrial arts

Purpose	Rank		Weighted Number	
	Jr.	Sr.	Jr.	Sr.
To help students select an occupational field	1	1	1287	2476
To help students learn to use power equipment and other machines	2	2	998	1146
To help students learn to use hand tools	3	5	778	675
To help students get a job when they graduate	4	3	627	1126
To learn safety practices	5	7	552	498
To learn about industrial processes	6	4	533	734
To make projects	7	6	442	613
To learn to fix things around the house	8	9	440	319
To learn about industrial materials	9	10	406	254
To learn a hobby	10	8	266	323
To learn how to buy products wisely	11	11	152	166
To help students see the values of science courses	12	12	102	114

Students were first asked if the course they were taking were required. If the course were required, they did not complete the question. Only 82 or 5 per cent of the senior high students were required to take the industrial arts course, while 620 or 48 per cent of the junior high students registered for the course because it was required.

The relative position of reasons for taking industrial arts is shown by rank in Table 5.

Table 5. Reasons given by students for registering for industrial arts courses

Reasons	Rank Jr.	Rank Sr.	Weighted Number Jr.	Weighted Number Sr.
I like to work with my hands.	1	1	940	1760
I wanted to make a certain project.	2	5	368	394
To help me choose a vocation.	3	2	256	1154
I plan to get a job in the area.	4	3	239	1019
It pertained to my hobby.	5	4	215	447
To prepare for trade school.	6	6	165	385
I liked the industrial arts teacher.	7	9	162	239
No home work.	8	11	118	194
To prepare for technical school.	9	7	115	357
My friends were registering for the course.	10	12	88	172
No other classes from which to choose.	11	10	80	225
Expected an easy credit.	12	8	70	276
The school counselor recommended the course.	13	13	57	138
Parents wishes.	14	14	49	100

At both the junior and senior high school level, the largest group of students indicated they registered for industrial arts because they wanted to "work with their hands," as indicated by the data in Table 5.

Junior high students listed "making a certain project" as the second highest reason for registering for the course; however, this item was fifth in the senior high school group. "Aid in choosing a vocation" was second in the senior high and third in the junior high. The relative picture of both groups was very similar. The largest difference in rank was four rank positions on the "expected an easy credit" item. The junior high ranked this twelfth, while senior high students placed it higher in the eighth position.

"The school counselor recommended the course" and "parents' wishes" were ranked as the last two positions by both groups.

A space for "other" responses was provided. One hundred and four or 8.1 per cent of the junior high students wrote in reasons, and 274 or 16 per cent of the senior high school students did. None of the write-in responses appeared frequently enough to be significant.

Table 6 presents data concerning what students believed their parents attitude to be toward their taking industrial arts courses. The data is given in percentages of responses to the four statements listed.

Table 6. Parents' attitude toward students registering for industrial arts according to students

Parents' Attitude	Percentages Junior High	 Senior High
Parents encourage my taking the course.	66	54
Parents did not care.	19	29
Parents insisted I take the course.	2	1
Parents did not know I was taking the course.	1	1
Other	6	9
No response	6	6
Total	100	100

For both the junior and senior high school groups, parents encouraged students to take the industrial arts course. The lowest item for both groups was "parents did not know students were taking the course."

A space was provided for "other" responses. Seventy-five or 6 per cent of the students in the junior high school group made such responses, while 147 or 9 per cent of the senior high students listed additional information. Most responses were similar to the choices, but no responses were made frequent enough to be significant.

Students were asked if they believed that science and industrial arts teachers worked together to provide an opportunity for practical application of the scientific principles being learned. According to Table 7 both junior and senior high school students do not know if industrial arts and science teachers are working together to provide the teaching of scientific principles.

Table 7. Students' opinions on whether or not science and industrial arts teachers work together providing opportunities for application of scientific principles

	Percentages	
Responses	Junior High	Senior High
Do not know	53	56
No	31	32
Yes	9	10
No response	7	2
Total	100	100

Table 8 presents responses to the question asked students as to which type of person they believed would benefit most from the industrial arts program. As the table indicates, a large majority thought that industrial arts would be of most benefit to the average student.

Table 8. Students' responses to question of which type of person would benefit most from industrial arts

Responses	Percentages Junior High	 Senior High
Average students	71	72
Physically handicapped students	10	3
Intellectually gifted	6	6
Mentally retarded	4	2
Other	9	15
No response	2	2
Total	100	100

One hundred and sixteen or 9 per cent of the junior high students wrote answers into the space provided for "other" responses. The item receiving the highest number of write-ins was "for everyone." Twenty-eight or 2.2 per cent of the students gave this for an answer. The second item was "those who are interested." Twenty-four students, representing 1.9 per cent of the group, gave this as an answer. None of the other responses was as high as 1 per cent.

Senior high school students "wrote in" 260 responses; this represented 15 per cent of the total. There were four responses that were of significance. "Any student" received 65 responses representing 3.8 per cent. 51 responses or 2.9 per cent went to "those who are most interested." "One who likes to work with his hands" was third with 31 responses or 1.8 per cent, while in fourth place was "one who wants to learn about industrial arts" with 21 responses or 1.4 per cent. None of the other responses were as high as 1 per cent.

Students were asked the question "for what occupational group they believed industrial arts courses would be of most value." The future occupations were listed, as shown in Table 9, and students responded with a first and a second choice.

Table 9. Students' judgment of the occupational group receiving the most value from industrial arts

Reasons	Rank Jr.	Rank Sr.	Weighted Number Jr.	Weighted Number Sr.
Future technician; such as, draftsman, electronic technician, etc.	1	2	920	1089
Future skilled worker (machinest, bricklayer, etc)	2	1	635	1101
Future engineer	3	4	432	523
Future semi-skilled worker (machine operator, etc)	4	3	420	648
Future scientist	5	5	35	46
Future dentist or medical doctor	6	6	22	37

It will be noted that as considered by students the occupational groups which receive the most value from industrial arts are the future technicians and future skilled worker.

There were 54 write-in responses by the junior high students which amounted to

4 per cent of the total. Only one write-in response totaled more than one per cent. This was "carpentry trades" which received 27 responses or 1.6 per cent.

Senior high school write-ins totaled 91 responses or 5 per cent. The significant item was "everyone" receiving 19 responses or 1.1 per cent.

Senior high industrial arts instruments contained three questions which were not included in the junior high instruments. Responses to these questions appear in Tables 10, 11, and 12. The relationship which students believed that industrial arts courses have toward their anticipated employment or additional schooling is presented in Table 10. The students were asked to rank three choices in order of importance to them.

Table 10. Value or industrial arts courses to future employment or schooling

Values Gained	Rank Sr.	Weighted Number Sr.
Provided me with skill in the use of tools, equipment, and machines which will help me gain employment.	1	2110
Provided me with information which will help me decide what my future occupation will be.	2	1991
Provided me with technical knowledge which will help me gain employment.	3	1498
Provided me with information about industrial processes which will help me hold a job.	4	874
Provided me with information which will be helpful in selection of and success in a technical school.	5	832
Provided me with information which will be helpful in selection of and success in a trade school	6	653

"Skill" and "Information development" were considered to be of most value and to have the closest relationship to the industrial arts program. These ranked 1 and 2 as indicated in Table 10.

There were 108 responses by students in the space marked "other," representing 6 per cent of the total group. There was one response that equaled one per cent of the total group. It was "a future occupation" and received 19 responses. All other responses were less than one per cent.

Senior high students were then asked if a trade and industrial class were available in their school if they would be interested in registering for it. Seventy-one per cent answered "yes"; 11 per cent answered "no", 15 per cent said "they did not know", and 3 per cent did not answer. Those who answered "yes" were asked to check from a list provided what courses they would like. The list and per cent of responses are found in Table 11.

Table 11. Trade and industrial classes desired by students who are now enrolled in industrial arts courses

Trade and Industrial Classes	Rank Sr.	Per cent* Sr.
Auto Mechanics	1	61
Electronics	2	31
Drafting	3	26
Woodworking	4	23
Metal Work	5	17
Other	6	6
Graphic Arts	7	3

*Because of multiple selections by some students, the percentages total more than 100 per cent.

Auto mechanics was by far the most popular course in the eyes of the students as almost two-thirds indicated that course as one in which they would like to enroll if it were taught as a trade and industrial subject.

None of the courses in the space provided for "other" was repeated more than a few times; therefore, they are not listed.

Another question that students were asked was whether or not they had opportunities to use the school shop for school activities such as science fair projects, making school play props, dance decorations, etc. They were asked to respond to the extent they were able to use the shop during school hours and after school. According to Table 12, approximately one-fifth to one-third are able to use shop facilities to some extent during and after school.

Table 12. Use of industrial art laboratory facilities for school activities

	Per cent of Responses	
Extent of use	During school	After school
Able to use the shop as much as you like	25	21
A little	34	32
Not at all	17	21
No response	24	26
Total	100	100

Opinions of Parents

The first question asked of parents was designed to identify which areas of industrial arts parents considered most beneficial to their children.

Table 13. Areas in which parents thought industrial arts was of most value

	Rank		Weighted Number	
Areas	Jr.	Sr.	Jr.	Sr.
To discover and to develop creative technical talents in students.	1	1	1417	1677
To provide general all-around technical knowledge and skills.	2	3	1069	1161
To provide pre-vocational experience of an intensified nature for those students interested in technical work.	3	2	833	1495
To provide vocational training for students who would not otherwise have this opportunity.	4	4	706	1036
To develop problem-solving skills relating to materials and processes.	5	6	411	319
To develop an understanding of the application of science and mathematics.	6	5	367	467
To develop worthy leisure-time activities.	7	8	310	273
To develop an understanding of our technical culture.	8	7	290	284
To develop consumer knowledge and appreciation and use of industrial products.	9	9	214	179

In response to this question, the parents of both the junior and senior high school student indicated, as shown in Table 13, that "discovering and developing creative technical talent in students" was the one of most value. "To provide general all-around technical knowledge and skills" and "providing pre-vocational experience of an intensified nature for those students interested in technical work" ranked in second and third place, respectively. However, the parents of the junior high students listed them in reverse order from the parents of the senior high students. The objective "to develop consumer knowledge and appreciation and use of industrial products" ranked ninth for both groups.

As shown in Table 14, 78 per cent of the parents of junior high school students and 79 per cent of the parents of senior high students indicated that the industrial arts program would be of most value to the average student. Only five per cent indicated that it would be of value to the intellectually gifted, and another five per cent thought it would be of value to the physically handicapped student.

Table 14. Parents' judgment of student type benefitting most from an industrial arts program

	Number		Per cent	
Type of Student	Jr.	Sr.	Jr.	Sr.
Average student	805	1061	78	79
Intellectually gifted	49	84	5	6
Physically handicapped students	49	43	5	3
Mentally retarded	21	2	2	1
No response	103	143	10	11
Total			100	100

In reference to the occupational areas in which industrial arts could make the greatest contribution, the parents of both the junior and senior high students ranked the future technician as first and the future skilled worker as second, as shown in Table 15. The future scientist and dentist or medical doctor ranked fifth and sixth by both groups of parents.

Table 15. Occupational areas that industrial arts activities contribute to most

Areas	Rank Jr.	Rank Sr.	Weighted Number Jr.	Weighted Number Sr.
Future technician (draftsman, electronic technician, etc)	1	1	916	1144
Future skilled worker (machinist, bricklayer, etc)	2	2	655	927
Future engineer	3	4	382	446
Future semi-skilled worker (machine operator, etc)	4	3	284	571
Future scientist	5	5	67	45
Future dentist or medical doctor	6	6	17	7

In ascertaining the attitude of the parents toward their son taking industrial arts, the majority of both the junior high school and senior high school parents, as indicated in Table 16, wanted their son in an industrial arts course. Seventeen per cent of the junior high and 25 per cent of the senio high stated that they did not become involved in the decision. It is interesting to note that two per cent of the parents of both the junior and senior high school student indicated they did not know their son was taking industrial arts courses.

Table 16. Attitude of parents toward their son taking industrial arts

Responses	Number Jr.	Number Sr.	Per cent Jr.	Per cent Sr.
Wanted him to take the industrial arts course	735	839	71	64
Did not become involved	182	325	17	25
Preferred he take more academic courses	48	69	5	6
Did not know he was taking the course	23	26	2	2
No response			5	5
Total			100	100

When the parents were asked if they thought the industrial arts courses provided opportunities for solving real problems that might have arisen from other classes, 45 per cent of the junior high parents and 43 per cent of the senior high parents indicated, as shown in Table 17, that they did. Another 38 per cent of the junior high and 41 per cent of the senior high school parents answered that they did not know. Only 14 per cent of the junior high and 15 per cent of the senior high school parents indicated that industrial arts did not provide an opportunity to solve problems from other areas.

Table 17. Opportunity to apply information received in industrial arts in other courses

Response	Number Jr.	Number Sr.	Per cent Jr.	Per cent Sr.
Yes, they had an opportunity	463	556	45	43
Did not know	392	530	38	41
No opportunity	146	198	14	15
No response			3	1
Total			100	100

In response to the question as to whether or not the industrial arts program could be improved by the industrial arts teachers cooperating with teachers of other school offerings, such as a laboratory project involving industrial application of chemistry or physics, 58 per cent of the parents of the junior high school students, as shown in Table 18, and 55 per cent of the senior high school students indicated that it would improve the industrial arts program.

Table 18. Industrial arts could be improved by cooperating with other courses--Parents' opinions

	Number		Per cent	
Responses	Jr.	Sr.	Jr.	Sr.
Yes, they could be improved	597	717	58	55
Do not know	298	415	29	32
No improvements	106	151	10	12
No response			3	1
Total			100	100

When asked ways the industrial arts program could be improved, 62 per cent of the parents of the junior high students, as shown in Table 19, indicated that manipulative skill should be stressed more. Sixty-six per cent of the parents of senior high school students desired to have more information about occupational opportunities taught to their sons.

Table 19. Ways the industrial arts program may be improved

Improvements	Number Jr.	Number Sr.	Per cent* Jr.	Per cent* Sr.
More information about occupational opportunities (jobs available, training required for jobs, etc.)	502	868	48	66
More manipulated skill (use of hand tools and machines)	658	694	62	53
More information about industrial processes (how products are produced)	211	237	20	18
More information about industrial materials (how steel and plastic are manufactured)	194	207	18	15
Less craft work (leather, tooling, plastic, jewelry, etc.)	77	95	7	7

*Percentages exceed 100% because of multipie selections of program improvements.

According to Table 20, approximately 50 per cent of the parents of both the junior and senior high stated that the classroom space and shop space were good. It is significant to note that approximately 20 per cent of the parents stated that they had not had an opportunity to observe the shop facilities of the industrial arts program in the school their son was attending.

Table 20. Parents' responses pertaining to the physical quality of the industrial arts shop and equipment

	Percentages Junior High					Percentages Senior High				
Responses	Good	Fair	Poor	No opportunity To observe	No response	Good	Fair	Poor	No opportunity To observe	No response
Adequate shop space	53	11	7	23	6	53	15	7	20	5
Adequate class space	51	14	6	21	8	46	13	6	18	17
Quantity & Quality of power equipment	51	13	5	22	9	48	15	7	21	9
Proper ventilation and dust removal	42	12	11	28	7	46	12	10	23	9

The response by the parents to the question concerning the availability of a trade and industrial course at the high school level and whether or not they would recommend their son taking the course is significant. As shown in Table 21, approximately 67 per cent of the junior high school parents and 78 per cent of the senior high school parents indicated they would recommend their son taking the trade and industrial course if it were available in the school.

Table 21. Parents interested in son taking a trade and industrial course if available

	Number		Per cent	
Responses	Jr.	Sr.	Jr.	Sr.
Yes	285	1018	67	78
No	689	243	28	22
No Response			5	0
Total			100	100

When asked to specify what occupational area they preferred the course to be in, the parents of junior high school students placed electronics highest with 47 per cent, as shown in Table 22. The next highest was auto mechanics with 37 per cent, and 29 per cent selected drafting. The parents of the senior high students placed the same three occupational areas at the top but in different order. As noted in Table 22, auto mechanics was highest with 42 per cent, and electronics ranked second with 41 per cent with drafting in third place with 35 per cent.

Table 22. Occupational area parents would prefer their son be enrolled in if trade and industrial courses were available in the high school

	Number		Per cent*	
Occupations	Jr.	Sr.	Jr.	Sr.
Auto Mechanics	256	429	37	42
Electronics	321	412	47	41
Drafting	203	356	29	35
Woods	169	204	25	20
Metals	65	153	9	15
Graphic Arts	31	43	5	4

*Percentages exceed 100% because some parents selected more than one course that they would like their son to enroll in.

When the parents were asked the question relating to what they anticipated their son would do after he graduated from high school, 60 per cent of the junior high school parents and 54 per cent of the senior high school parents, as revealed in Table 23, plan on their son's registering at a university or college. Another 20 per cent of the junior high parents and 17 per cent of the senior high parents replied that plans were indefinite. It should be noted that only 4 per cent of the junior high school parents and 13 per cent of the high school parents indicated the possibility of their son enrolling in a trade or technical school. Table 23 should be compared with Table 21 and 67 per cent and 78 per cent, respectively, of the junior and senior high school parents were interested in their son taking a trade and industrial course in high school if it were available.

Table 23. Anticipated plans of parents for their son after high school graduation

Future Plans	Number Jr.	Number Sr.	Per cent* Jr.	Per cent* Sr.
Register for college or university schooling	619	704	60	54
Register in a trade technical program	44	169	4	13
Enlist in the Armed Forces	47	138	4	10
Indefinite plans at this time	207	231	20	17
Seek employment	28	103	3	7
Other	307	329	29	25

*Percentages exceed 100 per cent because parents were asked to indicate the plans for the next two years and some selected two items to cover this period.

Opinions of Teachers

Table 24 shows the point of view of the teacher from different types of school organizations. It is obvious that both the junior and senior high school teachers feel that the main purpose of industrial arts is to develop in each student a measure of skill in the use of common tools and machines. The second purpose is to discover and develop creative technical talents in the students.

The high school teachers ranked the purpose "to provide pre-vocational experience of an intensified nature for those students interested in technical work" in the fourth place; while the junior high ranked it in ninth place. The junior high teachers ranked the "development of worthy leisure-time interests" in fifth place, while the senior high ranked it at the bottom in tenth place.

Table 24. Degree of emphasis that should be placed on the purposes of industrial arts according to teachers

	Rank		Weighted Number	
	Jr.	Sr.	Jr.	Sr.
To develop in each student a measure of skill in the use of common tools and machines.	1	1	345	504
To discover and to develop creative technical talents in students.	2	2	315	464
To develop problem-solving skills relating to materials and processes.	3	5	313	451
To provide general all-around technical knowledge and skills.	4	6	312	443
To develop worthy leisure-time interests.	5	10	308	394
To develop an understanding of our technical culture.	6	3	303	457
To develop consumer knowledge and appreciation and use of industrial products.	7	7	294	425
To develop an understanding of the application of science and mathematics.	8	9	262	404
To provide pre-vocational experience of an intensified nature for those students interested in technical work.	9	4	242	458
To provide vocational training for students who would not otherwise have this opportunity.	10	8	207	410

In Table 25 there were 312 respondents, and each respondent was allowed to make more than one choice. In general students are enrolled in industrial arts courses because these courses are a part of the regular school program.

At the high school level, 43 per cent of the teachers stated that students were placed in industrial arts courses by their administration because they were unable to handle academic work. Forty-two of the teachers stated that their administrators placed students in industrial arts courses because there was no other place to put them.

Table 25. Reasons administrators placed students in industrial arts classes as seen by industrial arts teachers

Reasons	Junior High Per cent*	Senior High Per cent*
A part of the regular school program	88	62
No other place to put the students	23	42
Students are unable to handle academic type classes	19	43
Students with a low I.Q. have more interest in this type of class	14	23
Interest and aptitude tests indicate a particular student can achieve in some area of industrial arts	11	19
They cause less trouble in industrial arts than in other classes	8	12

*Per cent columns total more than 100% because respondents were allowed to make more than 1 choice. There were 129 junior high and senior high school teacher respondents.

It can be noted from Table 26 that 38 per cent of the junior high school teachers and 27 per cent of the senior high school teachers thought that their administrators were excellent. It should be noted that only two junior high and seven senior high school teachers thought that their administration had a poor attitude toward industrial arts.

Table 26. Attitude of administrators toward industrial arts program as seen by the industrial arts teachers

Attitude	Number Jr.	Number Sr.	Per cent Jr.	Per cent Sr.
Excellent	48	49	38	27
Good	56	93	45	52
Fair	20	30	16	17
Poor	2	7	1	4
Total			100	100

Opinions of Administrators and Counselors

Questionnaires were provided for one principal or vice-principal and one guidance person from each school. Most district superintendents in the state were willing to co-operate and requested that their principals provide the necessary support to the study. With few exceptions, principals co-operated in the study.

There were three types of administrator and counselor questionnaires. One was designed for the junior high schools, one for senior high schools which did not have trade and industrial program offerings, and one for senior high schools which had trade and industrial program offerings. Many of the questions pertained to all three types of programs and were included in all three instruments. The industrial arts portion of the administrative and counselors questionnaire which was sent to schools with trade and industrial programs is included in this portion of the report because these same schools have industrial arts offerings also. The questions common to all three programs will be discussed first.

The common objectives of the industrial arts program were listed in the first question and administrators and counselors were asked to rate each objective by one, two, or three level of importance. They were then to indicate how well their school was meeting the objectives listed. This was indicated by one, two, or three with one indicating a high level of accomplishment while three was low.

There is considerable agreement among administrators and counselors as to the purpose of the industrial arts program. Both junior and senior high school administrators and counselors list as the most important objective "manipulative skill in the use of tools and machines," while the trade and industrial administrators and counselors listed this as second in importance.

As may be seen in Table 27, this general pattern of agreement exists for all objectives except two. These two objectives are opposite in purpose. One pertains to pre-vocational experiences which is high, fifth and sixth rank, with the trade and industrial group and senior high school group, respectively; while it was ranked tenth by the junior high school respondents. The other objective dealt with leisure-time interests which was second by the junior high school administrators and counselors, and fourth and fifth, respectively by the senior high school and trade and industrial administrators and counselors.

In Table 27 the ten objectives are listed and the responses indicated by a weighted number and rank.

Table 27. Importance of industrial arts objectives in the opinion of administrators and counselors

Objectives	Rank Jr.	Rank Sr.	Rank T&I*	Weighted Number Jr.	Weighted Number Sr.	Weighted Number T&I*
To develop in each student a measure of skill in the use of common tools and machines.	1	1	2	216	212	49
To develop worthy leisure-time interests.	2	4	9	187	178	37
To discover and develop creative technical talents in students.	3	2	3	185	191	47
To develop problem-solving skills relating to materials and processes.	4	7	6	171	173	42
To provide general all-around technical knowledge and skills.	5	5	7	167	177	41
To develop an understanding of our technical culture.	6	3	1	165	188	50
To provide vocational training for students having no other opportunity.	7	8	4	155	168	45
To develop consumer knowledge and appreciation of industrial products.	8	10	8	153	152	38
To develop an understanding of the application of science and math.	9	9	10	152	161	35
To provide pre-vocational experience of an intensified nature for those students interested in technical work.	10	6	5	147	176	44

*Responses to industrial arts questions by administrators who have trade and industrial programs in their schools as well as industrial arts.

Table 28 presents the opinion of the administrators and counselors as to which of their schools were meeting the objectives. It will be noted that there is a definite correlation between what they believed was important and how well they were meeting the objective. The two objectives showing the largest difference between importance and accomplishment were in providing technical knowledge and developing leisure-time interests. In both cases, the difference was 3.5 rank positions higher in accomplishment than level of importance.

Another question common to all three groups required the administrators and counselors to rank in order of their preference the future occupation industrial arts was serving most. Table 29 shows the choices provided and the responses given. A line labled "other" was provided, but no write in values were duplicated by other respondents.

There was complete agreement among junior and senior high school administrators and counselors pertaining to the group industrial arts serves best. Both considered "skilled worker" as the group served most, while "future medical men" were assumed helped least. The trade and industrial group differed from the other two in one area only; by reversing positions one and two, they placed the technician in the higher group. Positions three and four of the junior and senior high school administrators and counselors were tied responses by the trade and industrial group for position 3.5.

Table 28. Accomplishment of the objectives by the schools

Objectives	Rank			Weighted Number		
	Jr.	Sr.	T&I	Jr.	Sr.	T&I
To develop in each student a measure of skill in the use of common tools and machines.	1	1	3.5	198	189	41
To develop worthy leisure-time interests.	2	2	5.5	176	167	39
To discover and to develop creative technical talents in students.	3	4	1.5	159	146	42
To provide general all-around technical knowledge and skills.	4	3	3.5	158	147	41
To develop problem-solving skills relating to materials and processes.	5	6	7.0	147	139	38
To develop an understanding of our technical culture.	6	5	1.5	139	141	42
To develop an understanding of the application of science and math.	7	8	0.5	138	131	32
To provide vocational training for students having no other opportunity.	8	7	8.0	137	132	36
To develop consumer knowledge and appreciation and use of industrial products.	9	9	9.5	136	130	32
To provide pre-vocational experience of an intensified nature for those students interested in technical work.	10	10	5.5	129	124	39

Table 29. Value of industrial arts to various occupational groups

Objectives	Rank			Weighted Number		
	Jr.	Sr.	T&I	Jr.	Sr.	T&I
Future skilled worker (machinist, brickmason, etc.)	1	1	2.0	331	296	60
Future technician (draftsman, electronic technician, etc.)	2	2	1.0	296	282	66
Future semi-skilled worker (machine operator, etc.)	3	3	3.5	286	268	48
Future engineer.	4	4	3.5	186	168	48
Future scientist.	5	5	5.0	118	107	34
Future dentist or medical doctor.	6	6	6.0	91	78	18

In response to how students are selected for industrial arts courses, six statements were provided as choices. A space was provided for "other" responses; however, there were only six responses from all three groups and none was duplicated. The six statements and the responses in percentages are shown in Table 30. The questionnaires indicated that these statements were to pertain only to elective industrial arts courses.

Administrators and counselors in all three groups strongly indicated that students are seldom assigned to an industrial a class. They indicated by rank position No. 2 that interest and aptitude tests are often used in the placement of students in industrial arts classes. The two reasons listed lowest were "students with low I. Q. have more interest in this type of class," and "there are fewer discipline problems when they are in industrial arts classes."

Table 30. Why students are placed in industrial arts courses

Reasons	Rank			Weighted Number		
	Jr.	Sr.	T&I	Jr.	Sr.	T&I
Classes are seldom assigned by the administration; they are elected.	1	1.0	1.0	78	62	89
Interest and aptitude tests indicate a particular student can achieve in some area of industrial arts.	2	2.0	2.0	40	38	83
No other place to put students.	3	3.5	4.5	36	26	39
Students are unable to handle academic type classes.	4	3.5	3.0	31	26	50
There are fewer discipline problems when they are in industrial arts classes.	5	6.0	4.5	30	18	39
Students with low IQ have more interest in this type of class.	6	5.0	6.0	29	22	44

When asked if there should be a correlation between work in the sciences and industrial arts, administrators and counselors of all three types of programs indicated "yes" by nearly a three-fourths majority. Those who responded "yes" to the question were then asked to indicate if this correlation could be in team teaching. Two-thirds or more said that it could. These results are shown in Table 31.

In response to a question asking which students with given physical and mental capacities would benefit most from the industrial education program, all three groups of administrators and counselors responses fell into the same pattern, as shown in Table 32.

Table 31. Should there be a correlation between work in the sciences and industrial arts?

	Administrators and Counselors		
	Junior High	Senior High	Trade and Industrial*
	Percentages		
Yes	74	73	72
No	22	24	28
No Response	4	3	0

*Administrators and counselors of trade and industrial programs have industrial arts programs as well.

Table 32. Type of student which will benefit most from the industrial education program

Type of Student	Junior High	Senior High	Trade and Industrial
	Percentages		
Average students	46	68.9	44.4
Gifted students	9	4.1	22.2
Mentally slow students	3	2.7	0
Physically handicapped students	3	1.4	0

Administrators were asked if the industrial arts offerings in their schools were complete or if other courses should be added. Forty-eight per cent of the junior high school administrators thought that the offerings were complete, while only 20 per cent of the senior high school administrators indicated no additions were needed. The most satisfied group was the trade and industrial administrators with 56 per cent who believed all courses that should be offered were presently being offered. Those who believed additional offerings should be made were asked to indicated for each course area the reasons those offerings were not being made at present. Table 33 shows the course area and the percentage of responses for each reason for not offering the course.

Table 33 shows us that few additional course offerings are believed necessary. Among administrators of trade and industrial programs who thought additions needed to be made, the greatest dificiency was "lack of shop space for offering machine shop," as indicated by 25 per cent of the respondents. "Lack of space for machine shop" was also the deficiency most noted by senior high school administrators who had only industrial arts programs. The trade and industrial administrators also believe more space is needed for new automotive offerings. These as listed by the trade and industrial administrators were the only two deterrents to course offering which should be made available. Several trade and industrial and senior high school offerings are in the planning stage, but no junior high school offerings are being planned. Inadequate shop space was the greatest deterrent to offering additional courses at all three levels. Graphic arts was written in by two administrators, and lack of finances was listed as the reason for not establishing this offering in the program.

Table 33. Reasons offerings which should be made are not being made at present

	PERCENTAGES				
	0	X	1	2	3
General Woods					
Junior High	0	0	0	0	0
*Senior High	0	0	0	0	3
Trade and Industrial	0	0	0	0	13
General Metals					
Junior High	3	0	3	13	0
*Senior High	3	14	7	0	3
Trade and Industrial	0	0	0	0	0
Drafting and Drawing					
Junior High	5	13	0	3	0
* Senior High	2	0	0	2	3
Trade and Industrial	0	0	0	0	13
General Crafts					
Junior High	3	8	0	0	0
* Senior High	0	2	3	0	2
Trade and Industrial	0	0	0	0	13
Electricity and Electronics					
Junior High	3	15	3	8	0
* Senior High	3	9	9	3	5
Trade and Industrial	0	0	0	0	0
HIGH SCHOOL ONLY					
Welding					
*Senior High	0	10	0	2	2
Trade and Industrial	0	0	0	0	13
Machine Shop					
* Senior High	0	14	2	2	2
Trade and Industrial	0	25	0	0	0
Automotive					
*Senior High	2	12	3	2	3
Trade and Industrial	0	13	0	0	0

0 – School Enrollment Too Small
X – Shop Space Not Adequate
1 – Inadequate Finances
2 – Cannot Secure Qualified Teacher
3 – Being Planned
* – Senior high schools which have industrial art programs only

When asked what they believed to be the student's main reasons for taking industrial arts courses, the administrators and counselors of all three groups listed first "Students like to work with their hands." All three also agreed on the second reason which was, "Students wanted to make projects." Near the top of the list for both high school groups was the statement that students expected an easy credit, but this was quite low on the junior high school list. To be with friends and to receive vocational guidance were the next two reasons on the junior high school list. "Parents wishes" and "help in preparing for the technical schools" were ranked near the bottom on all three lists. The senior high administrators and counselors placed the reason that "the course pertains to their hobby" near the middle, while both the junior high school and the trade and industrial groups placed this reason near the bottom. There were 14 reasons listed for taking industrial arts courses. The reasons, weighted numbers, and rank position are given in Table 34.

The balance of the administrator's questions did not pertain to junior high school and were not part of their questionnaire. The remaining tables in this section will, therefore, present responses from administrators of senior high school with only industrial arts programs and senior high programs which also include trade and industrial courses.

Senior high school administrators and counselors were asked their opinion as to which industrial arts and trade and industrial education area was the most important to the future graduates of their school. This was to be answered in light of occupational opportunities, future training opportunities, and so forth. Six major areas were listed with a space provided for write in answers. There were very few write in answers; all of those that were written in properly belonged in one of the areas listed.

Table 34. Reasons students take industrial arts according to administrators and counselors

Reasons	Rank			Weighted Number		
	Jr.	Sr.	T&I	Jr.	Sr.	T&I
They like to work with their hands.	1	1	1	78	114	23
They want to make projects	2	2	2	62	78	10
The student's friends were registering for the course.	3	13	4	19	4	9
Industrial arts courses help them to choose a vocation.	4	5	6	17	23	6
They intend to get jobs in the same field.	5	8	7	15	13	5
Primarily they register for industrial arts because of the counselor's recommendation.	6	11	5	13	6	7
They like the industrial arts teacher.	7	9	9	12	8	4
Industrial arts courses help them prepare for trade schools.	8	3	10	11	25	3
They have no other classes from which to choose.	9	10	11	10	7	2
The student expected an easy credit.	10	4	3	9	22	9
Parents wishes.	11	14	14	7	3	0
There is no homework.	12	7	8	4	18	3
Industrial arts courses help them prepare for technical schools.	13	12	13	2	5	1
It pertains to their hobby.	14	6	12	1	17	2

Drafting and auto mechanics were on the top of the list, while crafts and graphic arts were on the low end. Table 35 shows the responses by a weighted number and rank.

Table 35. Importance of industrial arts and trade and industrial education to high school graduates

Areas	Rank Sr.	Rank T&I	Weighted Number Sr.	Weighted Number T&I
Drafting	1	2	166	27
Woodwork	2	4	128	14
Auto mechanics	3	1	125	42
Electricity and electronics	4	3	100	21
Metal work	5	5	61	12
Crafts	6	6	46	11
Graphic arts	7	7	18	1

In ascertaining the opinion of the administrators and counselors as to whether the school shop should be available for use on special school projects such as science fair projects, stage craft, and art projects, administrators and counselors were to respond yes or no. Their answer was decisively "yes" as shown in Table 36. There were five administrators who qualified their "yes" by adding "but under supervision." Those who answered "yes" were also requested to indicate if the shop should be available for use during school hours or after school. A large majority thought this opportunity should be after school.

Table 36. Industrial education shop should be open for students working on special school projects

Response	Senior High	Trade and Industrial
Yes	79%	89%
No	16%	11%
No Response	5%	0%
Total	100%	100%
RECOMMENDED TIME OF DAY THAT SHOP SHOULD BE OPEN		
After school	70%	81%
During school hours	22%	13%
No Response	8%	6%
Total	100%	100%

Administrators and counselors were then asked if they believed public schoools have a responsibility to provide trade and industrial programs (vocational courses meeting three hours per day) at the high school level (grades 11-12). Both the trade and industrial and senior high school administrators and counselors believed that they should provide these programs. There were 81 per cent "yes" responses by senior high school administrators and 89 per cent from the trade and industrial group. The "no" responses were 11 and 22 per cent for the senior high school and trade and industrial administrators and counselors, respectively. Those who responded "yes" to the question were then asked to check the areas and reasons why the offerings were not being made.

From Table 37 it can be seen that lack of student interest does not appear to be the main deterrent to the offering of trade and industrial courses. The senior high school administrators and counselors list "lack of funds" as the greatest obstacle with "lack of facilities" as second. "Lack of facilities" is, of course, directly related to "lack of funds." The administrators and counselors who were in schools already offering some trade and industrial courses did not indicate "lack of funds" or "lack of facilities" as an important reason for not making course offerings except in the area of electronics, and to a lesser degree, metals and graphic arts. In these schools, "lack of student interest" seemed to be the greatest problem.

Table 37. Reasons why trade and industrial courses are not offered in various areas

	Lack of funds		Lack of student interest		Scheduling difficulties		Lack of facilities		Lack of trained Teachers		Enrollment too small	
	Percentages											
Areas	*	**	*	**	*	**	*	**	*	**	*	**
Woods	27	0	5	19	17	12	25	0	5	6	20	6
Metals	35	6	7	25	12	19	38	12	7	12	15	19
Drafting	30	0	0	19	8	12	20	0	3	0	8	6
Electronics	40	19	2	19	12	12	40	31	18	12	17	19
Automotive	47	0	2	6	15	0	47	6	15	0	18	6
Graphic Arts	28	12	3	0	8	0	27	12	8	6	15	0

* Senior high schools without trade and industrial programs
** Senior high schools with trade and industrial programs
Percentages do not total 100 per cent because administrators were permitted to select as many items as were applicable.

When asked if they believed trade and industrial programs (not industrial arts) should be organized to include actual on-the-job work time in cooperation with local industry administrators, the senior high school administrators and counselors both with trade and industrial programs and without, said "yes." The responses are shown in Table 38.

Table 38. Trade and industrial programs should include actual on-the-job work time in cooperation with local industry

Response	Senior High	Trade and Industrial
	Percentages	
Yes	87	80
No	5	15
No response	8	5
Total	100	100

Today, due to automation, the average employee will need periodic retraining. Administrators and counselors were asked if they believed the public secondary schools were responsible for adult education programs to provide this training. Senior high school administrators with trade and industrial programs in their schools indicated an almost two to one objection to such offerings, while the senior high administrators without trade and industrial programs indicated less objection. Table 39 shows the response percentages.

Table 39. Public schools responsible for adult education programs to provide industrial retraining

Response	Senior High Percentages	Trade and Industrial Percentages
Yes	38	40
No	51	60
No response	11	0
Total	100	100

Those who answered "yes" were then asked to select the best program from a list of four types of programs. Table 40 shows the responses to the four types of programs.

Table 40. Adult industrial retraining programs considered best by administrators and counselors

Programs	Senior High Percentages	Trade and Industrial Percentages
Trade preparatory courses (all day trade classes) for post high school youth and adults leading to employment in industry.	17	0
Extension courses (part-time classes) for employed adults which may be held during working hours, a cooperative effort with industry.	20	12.5
Extension courses (evening classes) for employed adults held during non-working hours.	45	75
Supplementary training provided for job up-grading or foreman training.	18	12.5
Total	100	100.0

Several senior high school administrators and counselors wrote in statements pertaining to the offering of such programs. From the trade and industrial group there were two. One said such programs should be offered after, and one said they should be in special adult schools.

Most of the senior high write-in statements were made by one administrator only and are not reported here. These statements which were made more than once are as follows:

Number Making Statement	Statement
5	Should be offered in trade schools
3	Should be offered, but special faculties and staff are needed.
2	Needed provided funds are made available

Opinions of Industrial Management

The industrial management people indicated, as shown in Table 41, that they thought the main objective of an industrial arts program should be to help the student discover and develop creative technical talents. They thought the schools were doing a good job with this objective.

The objective they believed the schools were doing the best job in was "providing general all-around technical knowledge and skills," but they ranked this in seventh place as to importance. The developing of consumer knowledge and appreciation and use of industrial products ranked in the tenth place in both columns.

Table 41. Opinion of industrial management concerning the importance of industrial arts objectives and how well the objective is being indicated

	Importance of Objectives		Objectives Met By High School	
Objectives	*	**	*	**
a. To discover and to develop creative technical talents in students.	1.0	59	2.5	37
b. To provide vocational training for students who would not otherwise have this opportunity.	2.0	57	7.0	34
c. To develop an understanding of the application of science and mathematics.	3.0	55	2.5	37
d. To develop an understanding of our technical culture.	4.0	54	7.0	34
e. To develop in each student a measure of skill in the use of common tools and machines.	5.0	49	4.5	36
f. To provide pre-vocational experience of an intensified nature for those students interested in technical work.	6.5	47	9.0	30
g. To develop problem-solving skills relating to materials and processes.	6.5	47	7.0	34
h. To provide general all-around technical knowledge and skills.	8.0	45	1.0	38
i. To develop worthy leisure-time interests.	9.0	40	4.5	36
j. To develop consumer knowledge and appreciation and use of industrial products.	10.0	38	10.0	26
k. Other	11.0	3	11.0	1

*Rank

** Weighted Number

When asked to rank the various areas of industrial arts as to which they thought was most important, industrial management, as shown in Table 42, ranked "electricity/ electronics" in first place. The "crafts" ranked in seventh place.

Table 42. Industrial managements ranking of industrial arts areas

Industrial Arts Areas	Rank	Weighted Number
Electricity/electronics	1	41
Drafting	2	37
Machine shop	3	33
Auto body	4	24
Welding	5	6
Woodwork	6	3
Crafts	7	1
Other	8	0

TRADE AND INDUSTRY PROGRAMS

Opinions of Students

There were eight trade and industrial subjects taught in the public high schools in Utah in 1964-65. The findings are presented for each of the eight subjects in tabular form.

The number of students who completed the instruments in each of the program areas:

Course	No. of Students
Carpentry	24
Auto mechanics	176
Drafting	67
Machine shop	17
Electronics	40
Vocational Metals	17
Auto body	12

The first question queried students as to the occupation they would desire if such things as mental ability, finances, time in school, etc. were not considered. The purpose of this question was to determine their attitude toward the various occupations. Table 43 shows the occupations listed, and the responses for each of the eight groups in percentages.

A space was provided for "other" occupations. Several were written in; but they properly belonged in the choices given and were, therefore, added to the appropriate occupation.

Students in carpentry courses listed as their preference "the professions." This was followed by the "wood trades" which was the same occupational area in which they were enrolled. They had two other areas of interest--the "automotive trades" and the "semi-professions."

The students in auto mechanics chose the automotive trades as the occupation in which they were most interested. This was followed by the professions. Drafting students selected the professions as their first choice in occupations. Their second choice was the semi-professions, an occupation in which drafting is included. None of the other areas was selected to any great extent by the drafting students. Machine shop, welding, vocational metals, and auto body students indicated a preference for occupations in the fields in which they were training. Machine shop students indicated the semi-professions as second. The welding and vocational metal students listed as ties for second and third the professions and the semi-professions. The electronics and auto body students listed the professions as second.

With the exception of the machine shop students, all groups listed the professions as first or second choice; and all groups listed the area in which they were studying as the remaining first or second choice.

Table 43. Desirability of occupations in the opinions of students

Occupations	Trade and Industrial Programs							
	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metal	Auto body
	Percentages							
Professions (medical, law, teachers, etc.)	33	28	42	12	22	48	12	17
Semi-professional (Draftsman, airplane pilot, etc.)	17	8	34	18	22	5	12	0
Wood trades (Carpenter, cabinetmaker, etc.)	29	2	2	6	0	0	0	0
Electrical trades (Radio repairmen, electrician, etc.)	0	3	3	0	11	43	0	0
Metal trades (Welder, machinest, sheet metal worker, etc.)	0	3	3	41	33	3	47	0
Automotive trades (Auto-body, mechanic, etc.)	17	44	2	12	11	0	12	75
Plumbing trades (Pipe fitter, plumber, etc.)	0	1	0	0	0	0	0	0
Management (Office manager, plant manager, etc.)	0	2	6	0	0	0	0	0
No response	12	9	8	11	1	1	17	8
Total	100	100	100	100	100	100	100	100

Students were next asked to state what they believed to be the main purpose of the trade and industrial program in which they were enrolled. Four statements were made for convenience in giving their responses by a checkmark rather than a written statement. Space, was however, provided for additional comments. None of the students elected to write in statements.

Six of the eight groups selected preparation for vocational or technical school as the main purpose of the high school trade and industrial program. The two groups which deviated from this selection were the electronics students, who thought "enrichment of general education" was the main purpose, and the drafting students who thought "preparation for college entrance" was the main purpose.

Table 44. The main purpose of the trade and industrial program

	Trade and Industrial Programs							
	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metals	Auto body
Purposes	Percentages							
Preparation for college entrance	8	10	40	0	11	28	0	8
Preparation for vocational or technical school	38	44	25	44	44	25	47	67
Preparation for employment upon graduation	25	23	8	36	22	5	29	8
Enrichment of general education	25	23	27	19	22	35	24	17
No response	4	0	0	1	1	7	0	0
Total	100	100	100	100	100	100	100	100

Students were asked how adequate they thought the programs in which they enrolled were in meeting their needs for obtaining and/or holding a job. They were asked to respond to five statements by indicating good, fair, or poor. To give a rating value, these three choices were weighted by using a high of three for the "good" answers, etc. Table 45 is presented to show the views of each of the eight course groups to these statements. The weighted number is shown in Table 45 to reveal the degree of variance in the selected choices within the course. Weighted numbers between the eight course types cannot be compared because of the different number of students in each group.

It would appear from the information in Table 45 that similar emphasis is placed on the various instructional areas in the carpentry and machine shop courses. All five statements were ranked the same by the students. The ranking was very similar in all eight course groups. All but the drafting courses ranked the training they received in the area of industrial processes such as mass production as fifth or lowest. In drafting the lowest or fifth rank was "preparation in the use of power tools." The type of course and the tools and procedures used are, of course, responsible for the responses differing from the other seven programs in this respect.

All groups placed "preparation in the use of hand tools" on the upper end of the scale. All groups except welding placed "information about occupational opportunities" in third or fourth position while in the welding group, it was first place.

A second portion of this question consisted of six statements regarding instruction pertaining to general information. A "yes" or "no" to each of the six statements concerning their programs was responded to by students in each of the eight courses.

In reference to the question, "I have been taught how to present myself during an interview," only two groups, the machine shop and vocational metals students, gave

Table 45. The quality of the trade and industrial program in meeting the needs of students in getting and/or holding a job

Area of Training	Carpentry		Auto Mechanics		Drafting		Machine Shop		Welding		Electronics		Vocational Metals		Auto Body	
	*	**	*	**	*	**	*	**	*	**	*	**	*	**	*	**
Preparation in the use of power tools	1	68	2	419	5	11	1	49	4	16	2	90	3	45	2	30
Preparation in the use of hand tools	2	64	1	500	2	142	2	46	1	23	1	99	1	47	3	28
Training about occupational opportunities; such as availability of jobs	3	57	4	276	4	80	3	45	3	21	4	72	2	46	1	32
Information about industrial materials; such as, metals, woods	4	55	3	366	1	157	4	40	2	22	3	83	4	37	4	26
Information about industrial processes, such as mass production	5	46	5	231	3	89	5	34	5	15	5	71	5	32	5	25

* Rank
** Weighted Number

more "yes" responses than "no." The carpentry and electronics students strongly responded "no" to this question.

The metals groups, machine shop, welding, and vocational metals were again the only students who indicated "yes" to the statement that they had been taught to prepare letters of application for employment. As in the first question, the carpentry and electronics students both strongly stated "no." In response to this statement, the auto body course students also responded with a large majority of "no" answers.

All of the eight groups with the exceptions of the machine shop students indicated, with a large majority of "no" answers, that they had not been made acquainted with the fringe benefits; such as, workman's compensation, sick leave, retirement, etc.

In response to the fourth and fifth statements refering to instruction pertaining to unions, their dues, relationship to management, etc., all of the eight groups indicated by a majority of "no" answers, that this instruction was not being given.

The sixth statement was the only one receiving a majority of "yes" answers by the eight groups. This statement asked students if they had been taught how to work with others. The six statements and the responses in percentages are presented in Table 46.

The next question consisted of two sections designed to determine the primary and secondary reasons the students enrolled in the trade and industrial program. The first section pertained to the primary reason. Six reasons were given enabling students to make responses by a check mark. For those who could not find the appropriate reason among the six, a line marked "other" was provided.

Drafting and electronics students believed the program to be a good background for the engineering program they were intending to take in college, and the students in carpentry chose this reason along with a tied first of "using the information for employment." Students in the other five courses programs (auto mechanics, machine

Table 46. Statements regarding instruction pertaining to information presented in courses

Statements	Carpentry		Auto Mechanics		Drafting		Machine Shop		Welding		Electronics		Vocational Metals		Auto Body	
	Yes*	No*	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1. I have been taught how to present myself during an interview.	29	41	45	55	42	44	59	41	44	57	17	83	53	47	50	50
2. I have been taught how to prepare letters of application for employment.	17	83	37	63	20	65	71	29	67	33	15	85	53	47	17	83
3. I have been acquainted with fringe benefits; such as, workman's compensation, sick leave, retirement, etc.	12	88	22	78	12	72	35	65	56	44	17	83	17	83	17	83
4. I have been taught the relationship of union to management.	12	88	27	73	12	72	35	65	11	89	25	75	12	88	33	67
5. In reference to unions, I have been taught about dues, need to belong, benefits, etc.	8	92	22	78	9	75	35	65	33	67	17	83	23	77	25	75
6. In reference to personnel relationship I have been taught how to work with others; such as, foreman, co-workers, etc.	88	12	85	15	72	18	94	6	100	0	75	25	77	23	92	8

* Responses are shown in percentages

shop, welding, vocational metals, and auto body) listed "preparation for entrance into a trade or vocational school" most frequently as the primary reason for enrolling in the trade and industrial program.

Responses which were written into the "other" space were from thirteen auto mechanics and three electronic students listing "because of an interest in the course." Eight auto mechanics, six drafting, and two carpentry students indicated that they were taking the course for a more complete "general education." Other comments were made, but they were only single statements and will not be reported.

Table 47 shows the six reasons and the responses in percentages.

To ascertain the secondary reason for enrolling in trade and industrial courses, thirteen reasons were provided for checking by students.

Carpentry, machine shop, and vocational metals students indicated most frequently that the reason they enrolled in trade and industrial courses was that they liked to work with their hands. Auto mechanics, auto body, and welding (a tie with challenging work) students selected, "I believe the work is challenging and there is a great opportunity to live a useful and productive life." "It pertains to my hobby" was the reason most selected by the electronics students.

The thirteen reasons along with the percentages of responses to each are found in Table 48.

Table 47. Primary reasons why students enroll in trade and industrial programs

Reasons	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metals	Auto body
	Percentage							
When I leave high school, I expect to get a job in the area in which I am training.	21	15	5	12	33	5	18	17
Because of the experience I have had doing part-time or summer work in the trade I am studying and I like the work.	8	13	0	6	12	13	6	0
I believe it to be a good background for the engineering program I am going to take in college.	21	12	51	18	0	45	24	8
Because of finances or other reasons, I have no prospects of attending college, and I am accepting trade and industrial training as a substitute.	0	4	6	0	0	0	0	25
Preparation for trade or vocational school.	13	29	15	30	33	10	30	33
Provided me with skills to work my way through college.	13	29	11	0	22	10	18	17
No response.	24	18	12	34	0	17	4	0
Total	100	100	100	100	100	100	100	100

Table 48. Secondary reasons students enroll in trade and industrial programs

	Trade and Industrial Programs							
Reasons	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metals	Auto body
	Percentages							
Because my friends are taking it	4	0	0	0	0	0	0	0
Easy high school credit	4	0	0	6	0	0	0	0
Wanted to work on a certain project	0	5	2	0	0	3	6	0
Do not like homework	0	0	0	0	0	0	6	0
Pertains to my hobby	13	10	5	0	0	44	6	8
Like to work with my hands	50	22	17	24	22	5	41	8
I registered for this because of the counselors recommendations	0	2	0	0	0	0	0	0
Would prefer other trade and industrial but it was not offered at my school	4	2	0	12	0	0	0	0
I liked the instructor	4	1	5	0	0	0	0	0
I believe the work is challenging and there is a great opportunity to live a useful and productive life	4	18	37	6	33	13	24	25
I do not like academic subjects	0	1	0	0	0	0	0	0
I intend to get a job in the field in which I am training	17	34	25	18	33	33	0	33
My parents wanted me to take the course	0	1	0	0	0	0	0	0
No response	0	4	9	12	12	2	17	26
Total	100	100	100	100	100	100	100	100

Students were then asked if their parents thought they had made a wise decision in taking the trade and industrial course. None of the students in the eight groups said that his parents did not know he was taking the course. By far the highest majority said that their parents had left the choice up to them. A few students from all groups indicated that their parents wanted them to take the course. Only a very small group of parents insisted that their sons take the course with the exceptions of the vocational metals group where 12 per cent indicated that their parents insisted they take the course. None of the "write-in" statements appeared more than once.

Table 49 shows the attitude of parents toward their sons taking the course.

Table 49. What parents thought about their sons' enrollment in a trade and industrial course

	Trade and Industrial Programs							
	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metals	Auto body
Parent's Attitude	Percentages							
Yes, they insisted that I take the course.	0	0	2	3	0	0	0	0
They wanted me to take the course.	13	13	17	18	11	5	18	17
They left the choice up to me.	88	84	76	71	89	93	77	75
They did not know that I was in the course.	0	0	0	0	0	0	0	0
No response.	9	13	5	8	0	2	5	8
Total	100	100	100	100	100	100	100	100

Students were asked to indicate what they planned to do for the first two years following high school graduation. "Attending a trade or vocational school" was listed most frequently by only students in two courses. These courses were auto body and machine shop. Students from all other six courses, as shown in Table 50, listed most often "attendance at a college or university" as their plans for the next two years. None of the students wrote-in-plans in the space marked "other" that were different than the choices provided. The average of the eight areas regarding intent to go to college or university was 44 per cent.

Table 50. Student's plans for the first two years following graduation

	Trade and Industrial Programs							
	Carpentry	Auto mechanics	Drafting	Machine shop	Welding	Electronics	Vocational metals	Auto body
Student's Plans	Percentages							
Accept employment in the field in which I am taking my trade and industrial training.	4	18	2	17	22	0	18	8
Accept employment in another field.	16	10	6	6	0	3	18	8
Serve on a mission for my church.	25	9	12	18	0	15	29	0
Attend a college or university.	42	31	72	29	56	68	35	17
Serve in the Armed Forces.	16	12	13	6	11	8	18	17
No response.	0	0	0	0	0	0	0	0

* Percentages exceed 100 per cent because some students selected were more than one area indicating intended change during the first two years following graduation.

Students were asked to indicate by checking "good, fair, or poor" their opinion of the physical conditions of the facilities and equipment used in their program.

Carpentry students ranked dust removal, proper ventilation, and natural lighting best. They listed storage for projects and adequate work benches lowest.

The auto mechanics students considered adequate class space, safety devices and instruction, and blackboard lighting good. Quality of hand tools, adequate work benches, facilities for movies, and dust removal were poor.

Drafting students rated artificial lighting good but thought natural lighting was not as good. They also thought class desks were good. They listed blackboard space and lighting on the blackboard among the "good" items. Facilities for movies received the lowest rating.

Machine shop students considered their class space and class desks as the best. Also listed good were quantity of hand tools, blackboard space, and adequate work benches. They rated dust removal, storage for projects and ventilation poorest on the list.

Blackboard space and lighting on the blackboard was rated high by welding students. Storage for projects was rated low as was facilities for movies and film strips.

Electronic students thought wall outlets, artificial lighting, and test equipment were good. Facilities for movies and storage for projects were poor.

The areas rated high by the vocational metal students were adequate shop space, adequate safety devices, and adequate class desks. The areas rated low were wall outlets, quantity of hand tools and lighting on the blackboard.

Auto body students rated condition of power tools and equipment "good" and rated shop and class space, ventilation, and facilities for movies "low."

Considering the over all quality of the eight course areas, storage for projects rated poor as did natural lighting and facilities for movies and film strips. The highest rating of good facilities went to blackboard space, adequate class desks, and adequate class space.

Tables 51 through 58 present the responses for each of the eight groups.

Table 51. Opinions of carpentry shop students concerning physical conditions of facilities and equipment

Areas	Percentages Good	Fair	Poor	No Response
A. Adequate shop space	37	54	8	1
B. Adequate class space	62	21	17	0
C. Adequate class desks	67	12	17	4
D. Adequate work benches	25	17	58	0
E. Number of hand tools	42	37	21	0
F. Quality of hand tools	37	46	17	0
G. Amount of power tools and equipment	54	42	4	0
H. Condition of power tools and equipment	37	58	4	1
I. Lighting				
1. Artificial	79	8	4	9
2. Natural	54	17	0	29
J. Wall outlets	46	33	17	4
K. Dust removal	88	12	0	0
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	79	17	0	4
M. Test equipment	12	12	21	55
N. Facilities for movies and film strips	71	4	21	4
O. Blackboard space	71	17	4	8
P. Lighting of blackboard	62	21	8	9
Q. Storage areas				
1. For projects	21	29	46	4
2. For materials	29	33	29	9
R. Adequate safety devices and instruction	54	37	4	5

Table 52. Opinions of auto mechanics shop students concerning physical conditions of facilities and equipment

Areas	Good	Fair	Poor	No Response
	Percentages			
A. Adequate shop space	36	40	23	1
B. Adequate class space	74	20	4	2
C. Adequate class desks	61	30	7	2
D. Adequate work benches	43	34	23	0
E. Number of hand tools	47	35	13	5
F. Quality of hand tools	61	34	5	0
G. Amount of power tools and equipment	45	41	13	1
H. Condition of power tools and equipment	50	40	7	3
I. Lighting				
1. Artificial	48	35	15	2
2. Natural	33	37	17	13
J. Wall outlets	48	33	16	3
K. Dust removal	24	41	23	12
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	46	32	21	1
M. Test equipment	60	33	5	2
N. Facilities for movies and film strips	40	35	23	2
O. Blackboard space	60	35	4	1
P. Lighting of blackboard	64	27	8	1
Q. Storage areas				
1. For projects	24	40	33	3
2. For materials	25	39	32	4
R. Adequate safety devices and instruction	62	32	5	1

Table 53. Opinions of drafting shop students concerning physical conditions of facilities and equipment

Areas	Good	Fair	Poor	No Response
	Percentages			
A. Adequate shop space	46	10	0	44
B. Adequate class space	67	19	9	5
C. Adequate class desks	81	9	4	6
D. Adequate work benches	51	10	4	35
E. Number of hand tools	52	21	2	26
F. Quality of hand tools	61	10	3	26
G. Amount of power tools and equipment	15	9	2	74
H. Condition of power tools and equipment	21	6	3	70
I. Lighting				
1. Artificial	84	4	0	12
2. Natural	63	16	9	12
J. Wall outlets	51	21	4	24
K. Dust removal	46	9	2	43
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	36	16	4	44
M. Test equipment	36	9	4	51
N. Facilities for movies and film strips	22	34	18	26
O. Blackboard space	78	15	2	5
P. Lighting of blackboard	75	13	0	12
Q. Storage areas				
1. For projects	60	25	8	7
2. For materials	63	21	2	14
R. Adequate safety devices and instructions	58	12	0	30

Table 54. Opinions of machine shop students concerning physical conditions of facilities and equipment

	Areas	Percentages			
		Good	Fair	Poor	No Response
A.	Adequate shop space	41	59	0	0
B.	Adequate class space	82	12	6	0
C.	Adequate class desks	76	12	12	0
D.	Adequate work benches	65	29	6	0
E.	Number of hand tools	77	23	0	0
F.	Quality of hand tools	53	41	6	0
G.	Amount of power tools and equipment	59	35	6	0
H.	Condition of power tools and equipment	59	41	0	0
I.	Lighting				
	1. Artificial	53	35	12	0
	2. Natural	53	18	23	6
J.	Wall outlets	35	47	18	0
K.	Dust removal	18	53	29	0
L.	Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	35	35	29	1
M.	Test equipment	47	35	12	6
N.	Facilities for movies and film strips	41	35	23	11
O.	Blackboard space	65	35	0	0
P.	Lighting of blackboard	53	29	12	6
Q.	Storage areas				
	1. For projects	29	35	35	1
	2. For materials	50	35	6	9
R.	Adequate safety devices and instruction	77	11	12	0

Table 55. Opinions of welding shop students concerning physical conditions of facilities and equipment

Areas	Percentages			
	Good	Fair	Poor	No Response
A. Adequate shop space	56	44	0	0
B. Adequate class space	56	44	0	0
C. Adequate class desks	67	33	0	0
D. Adequate work benches	67	33	0	0
E. Number of hand tools	67	33	0	0
F. Quality of hand tools	56	33	11	0
G. Amount of power tools and equipment	33	44	22	1
H. Condition of power tools and equipment	56	33	11	0
I. Lighting				
1. Artificial	56	22	0	22
2. Natural	67	22	0	11
J. Wall outlets	56	44	0	0
K. Dust removal	0	78	22	0
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	44	44	11	1
M. Test equipment	22	44	33	1
N. Facilities for movies and film strips	11	22	67	0
O. Blackboard space	78	22	0	0
P. Lighting of blackboard	78	22	0	0
Q. Storage areas				
1. For projects	33	11	56	0
2. For materials	67	11	22	0
R. Adequate safety devices and instruction	56	33	11	0

Table 56. Opinions of electronics shop students concerning physical conditions of facilities and equipment

Areas	Percentages			
	Good	Fair	Poor	No Response
A. Adequate shop space	35	32	33	0
B. Adequate class space	53	22	25	0
C. Adequate class desks	55	32	10	3
D. Adequate work benches	35	53	12	0
E. Number of hand tools	35	45	20	0
F. Quality of hand tools	37	32	29	2
G. Amount of power tools and equipment	25	43	32	0
H. Condition of power tools and equipment	40	40	18	2
I. Lighting				
1. Artificial	70	25	5	0
2. Natural	22	29	25	24
J. Wall outlets	75	22	3	0
K. Dust removal	35	35	18	12
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	32	35	22	11
M. Test equipment	73	18	8	1
N. Facilities for movies and film strips	10	38	48	4
O. Blackboard space	25	42	30	3
P. Lighting of blackboard	55	30	13	2
Q. Storage areas				
1. For projects	15	40	43	2
2. For materials	18	48	30	4
R. Adequate safety devices and instruction	68	29	3	0

Table 57. Opinions of vocational metals shop students concerning physical conditions of facilities and equipment

Areas	Percentages			
	Good	Fair	Poor	No Response
A. Adequate shop space	35	53	12	0
B. Adequate class space	71	23	6	0
C. Adequate class desks	71	29	0	0
D. Adequate work benches	59	35	6	0
E. Number of hand tools	59	23	18	0
F. Quality of hand tools	59	35	0	6
G. Amount of power tools and equipment	65	18	12	5
H. Condition of power tools and equipment	59	29	6	6
I. Lighting				
1. Artificial	53	18	6	33
2. Natural	29	6	0	65
J. Wall outlets	35	35	18	12
K. Dust removal	23	65	6	6
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	59	35	6	0
M. Test equipment	29	59	12	0
N. Facilities for movies and film strips	47	47	0	6
O. Blackboard space	53	41	6	0
P. Lighting of blackboard	53	29	18	0
Q. Storage areas				
1. For projects	23	65	6	6
2. For materials	29	47	6	12
R. Adequate safety devices and instructions	77	23	0	0

Table 58. Opinions of auto body shop students concerning physical conditions of facilities and equipment

	Percentages			
Areas	Good	Fair	Poor	No Response
A. Adequate shop space	0	8	92	0
B. Adequate class space	8	17	75	0
C. Adequate class desks	25	42	33	0
D. Adequate work benches	25	58	8	9
E. Number of hand tools	17	50	33	0
F. Quality of hand tools	33	50	17	0
G. Amount of power tools and equipment	0	58	42	0
H. Condition of power tools and equipment	57	33	0	0
I. Lighting				
1. Artificial	25	50	25	0
2. Natural	8	67	0	25
J. Wall outlets	16	67	17	0
K. Dust removal	0	33	67	0
L. Proper ventilation (such as exhaust fans for welding, spray booth, etc.)	0	25	75	0
M. Test equipment	8	67	25	0
N. Facilities for movies and film strips	0	25	75	0
O. Blackboard space	25	50	25	0
P. Lighting of blackboard	25	50	25	0
Q. Storage areas				
1. For projects	8	50	42	0
2. For materials	0	75	17	8
R. Adequate safety devices and instruction	17	75	8	0

The next question was designed to determine the value of industrial arts as a preparatory course for trade and industrial offerings. Students were asked to indicate for the industrial arts courses they had taken how helpful the courses were in preparing them for the trade and industrial course they were in at the time. Tables 59 through 66 show the responses of the students of the eight types of trade and industrial programs now in the state of Utah.

Carpentry students, in general, believed industrial arts courses were helpful as indicated in Table 59. However, twenty-five per cent of the carpentry students believed the woods courses which they had taken were of very little or no help.

Table 59. Value of industrial arts courses completed by carpentry trade and industrial students

Courses Taken	Per cent*	Helpful	Little Help	No Help	Total
		Values in Percentages**			
Auto mechanics	17	50	50	0	100
Drafting	29	57	43	0	100
Electricity/electronics	8	50	50	0	100
Woods	79	69	26	5	100
Crafts	33	75	25	0	100
Machine shop	13	100	0	0	100
Welding	13	67	0	33	100

* Per cent of the carpentry students who had taken industrial arts course listed

** Per cent of those who had taken the industrial arts course listed

Prior to taking trade and industrial carpentry courses, carpentry students had taken an average of two industrial arts courses.

Most students enrolled in trade and industrial auto mechanics courses felt that industrial arts auto mechanics were of value to them. Woods, drafting, and crafts courses appeared to be the least value to them.

Table 60. Value of industrial arts courses completed by auto mechanics trade and industrial students

Courses Taken	Per cent*	Values in Percentages** Helpful	Little Help	No Help	Total
Auto mechanics	73	95	4	1	100
Drafting	44	49	39	12	100
Electricity/electronics	30	58	25	17	100
Woods	66	53	28	19	100
Crafts	37	46	34	20	100
Machine shop	22	66	26	8	100
Welding	27	87	13	0	100

* Per cent of the auto mechanics students who had taken the industrial arts course listed.

** Percentage of those who had taken the industrial arts course listed.

Prior to taking trade and industrial auto mechanics, auto mechanics students had taken an average of three industrial arts courses.

Trade and industrial drafting students, as presented in Table 61, definitely thought that industrial arts drafting courses were beneficial to their vocational program. Woods and crafts courses contributed less than others.

Table 61. Value of industrial arts courses completed by drafting trade and industrial students

Courses Taken	Per cent*	Helpful	Little Help	No Help	Total
		Values in Percentages**			
Auto mechanics	19	46	39	15	100
Drafting	81	95	5	0	100
Electricity/electronics	13	45	33	22	100
Woods	69	71	20	9	100
Crafts	34	48	30	22	100
Machine shops	13	89	11	0	100
Welding	24	69	25	6	100

* Per cent of the drafting students who had taken the industrial arts course listed.

** Percentages of those who had taken the industrial arts course listed.

Prior to taking trade and industrial drafting, drafting students had taken an average of 2.5 industrial arts courses.

Industrial arts welding, machine shop, and drafting courses were of most help to machine shop trade and industrial students. However, forty-one per cent of the machine shop students believed the industrial arts machine shop was of very little help in their trade and industrial course, as shown in Table 62.

Table 62. Value of industrial arts courses completed by machine shop trade and industrial students

Courses Taken	Per cent*	Values in Percentages**			Total
		Helpful	Little Help	No Help	
Auto mechanics	12	0	50	50	100
Drafting	35	66	17	17	100
Electricity/electronics	12	0	0	100	100
Woods	53	22	56	22	100
Crafts	39	20	40	40	100
Machine shop	38	53	47	0	100
Welding	41	72	14	14	100

* Per cent of the machine shop students who had taken the industrial arts course listed.

** Percentages of those who had taken the industrial arts course listed.

Prior to taking trade and industrial machine shop, machine shop students had taken an average of 2.8 industrial arts courses.

A relatively high percentage (67%) of the trade and industrial welding students had taken industrial arts welding. All who responded believed that it was helpful to them, as shown in Table 63.

Table 63. Value of industrial arts courses completed by welding and industrial students

Courses Taken	Per cent*	Values in Percentages**			Total
		Helpful	Little Help	No Help	
Auto mechanics	11	0	0	11	100
Drafting	56	20	80	0	100
Electronics/electricity	11	100	0	0	100
Woods	67	17	50	33	100
Crafts	56	0	100	0	100
Machine shop	0	0	0	0	0
Welding	56	100	0	0	100

* Per cent of the welding students who had taken the industrial arts course listed.

** Percentages of those who had taken the industrial arts course listed.

Prior to taking trade and industrial welding, welding students had taken an average of 2.6 industrial arts courses.

Sixty per cent, according to Table 64, of the electronics students who had previously taken electricity in the industrial arts department were of the opinion that the course was helpful to them in their trade and industrial program. The students believed, in general, that the other industrial arts courses were of value also.

Table 64. Value of industrial arts courses completed by electronics trade and industrial students

Courses Taken	Per cent*	Values in Percentages**			Total
		Helpful	Little Help	No Help	
Auto mechanics	28	64	27	9	100
Drafting	35	71	29	0	100
Electricity/electronics	68	89	11	0	100
Woods	60	67	21	12	100
Crafts	35	36	43	21	100
Machine shop	7.5	100	0	0	100
Welding	7.5	100	0	0	100

* Per cent of the electronic students who had taken the industrial arts course listed.

** Percentage of those who had taken the industrial arts course listed.

Prior to taking trade and industrial electronics, electronics students had taken an average of 2.4 industrial arts courses.

It appears from Table 65 that most all of the industrial arts courses were considered of some help to the vocational metals students.

Table 65. Value of industrial arts courses completed by vocational metals trade and industrial students

Courses Taken	Per cent*	Values in Percentages** Helpful	Little Help	No Help	Total
Auto mechanics	29	80	20	0	100
Drafting	23	100	0	0	100
Electricity/electronics	35	83	17	0	100
Woods	59	90	10	0	100
Crafts	23	75	25	0	100
Machine shop	65	100	0	0	100
Welding	35	83	17	0	100

* Per cent of the vocational metals students who had taken the industrial arts course listed.

** Percentage of those who had taken the industrial arts course listed.

Prior to the taking of trade and industrial vocational metals, vocational metals students had taken an average of 2.7 industrial arts courses.

The opinion of auto body trade and industrial students were almost equally divided between helpful, little, or no help regarding the value of previously taken industrial arts courses. Data is presented in Table 66.

Table 66. Value of industrial arts courses completed by auto body trade and industrial students

Courses Taken	Per cent*	Values in Percentages** Helpful	Little Help	No Help	Total
Auto mechanics	8	100	0	0	100
Drafting	0	0	0	0	0
Electricity/electronics	8	0	0	100	100
Woods	75	33	33	34	100
Crafts	58	28	28	44	100
Machine shop	0	0	0	0	0
Welding	8	0	100	0	100

* Per cent of the auto body students who had taken the industrial arts course listed.

** Percentage of those who had taken the industrial arts course listed.

Prior to taking trade and industrial arts auto body, auto body students had taken an average of 1.5 industrial arts courses.

Students were then asked to indicate the contribution industrial arts instruction made that was of most value to them. The results are shown in Table 67.

As a combined group, students believe the most value they received was in obtaining skill in using the tools of their trade. "Obtained an interest", "industrial processes, materials, and machines", and "how to work with others" followed in that order. Vocational metals students differed from the group in general by strongly indicating that the greatest value gained was in stimulating them to learn more. The machine shop students most frequently listed learning about industrial processes, materials, and machine.

Table 67. Contribution industrial arts instruction made of most value to students

	Trade and Industrial Programs							
	Carpentry	Auto Mechanics	Drafting	Machine Shop	Welding	Electronics	Vocational Metals	Auto Body
Contribution	PERCENTAGES							
Taught me how to work with people.	8	11	5	0	0	5	0	16
Taught me the skills in using the tools of the trade.	67	46	25	24	56	48	24	68
Taught me about industrial processes, materials, and machines.	17	16	28	31	22	10	23	0
Taught me enough about the area that I wanted to learn more.	4	24	28	12	11	30	53	16
No response.	4	3	14	23	11	7	0	0
Total	100	100	100	100	100	100	100	100

Students were asked to respond to the question; "Are you taking any industrial arts courses now?" It was explained to the students that this question did not refer to the trade and industrial courses in which they were presently enrolled, but only to the industrial arts one hour courses.

Table 68 shows that for each of the eight trade and industrial course offerings, fifty per cent or more students are also simultaneously enrolled in an industrial arts course.

Table 68. Trade and industrial students enrolled simultaneously in industrial arts courses

	Percentages			
Trade and Industrial Course	Yes	No		Total
Carpentry	75	25	0	100
Auto Mechanics	56	42	2	100
Drafting	58	39	3	100
Machine Shop	88	12	0	100
Welding	56	44	0	100
Electronics	70	23	7	100
Vocational Metals	71	29	0	100
Auto Body	50	50	0	100

Table 69 is presented to show which industrial arts courses the students of the various trade and industrial courses were taking. Figures in Table 69 are percentages of the total students who are taking each trade and industrial subject.

It should be noted that in each case the highest number of students in a given course are taking the same industrial arts course in addition to the trade and industrial course.

This gives the student one hour more than the three hour block in his area. For example, 60 per cent of the electronics students are also enrolled in industrial arts electronics, and 44 per cent of the welding students are also enrolled in industrial arts welding courses.

It is surprising to note the high percentage of students who are taking industrial arts in addition to trade and industrial courses. The number is 50 per cent or greater for all groups. The per cent of those taking two industrial arts courses is also very large.

The auto body trade and the industrial arts group had the highest numbers of students who were not also enrolled in industrial arts, but even these groups had one-half of their students in industrial arts. Note that in every case there is a high percentage of students who are taking the same industrial arts course area as trade and industrial courses. For example, 46 per cent of the trade and industrial carpentry students are taking industrial arts woods and 40 per cent of the auto mechanics students are taking industrial arts auto mechanics. The machine shop programs have the highest number taking industrial arts in addition to trade and industry with 88 per cent taking one course and 42 per cent taking two industrial arts courses.

Table 69. Industrial arts courses taken concurrently with a trade and industrial course

	Trade and Industrial Programs							
	Carpentry	Auto Mechanics	Drafting	Machine Shop	Welding	Electronics	Vocational Metals	Auto Body
Industrial Arts Courses	Per cent Enrolled In Trade and Industrial Program and Industrial Arts Course							
Auto Mechanics	21	40	6	0	0	8	6	8
Auto Body	0	0	0	0	0	0	0	42
Drafting	13	9	30	12	0	3	6	0
Electricity/Electronics	4	4	2	0	11	60	6	0
Welding	4	9	9	18	45	0	35	0
Woods	46	6	13	12	0	5	12	0
Crafts	25	2	6	0	0	3	0	0
Machine Shop	8	10	0	88	0	5	41	0
Per cent who are not taking industrial arts in addition to trade and industry	25	43	43	12	44	16	29	50
Per cent taking one industrial arts course in addition to trade and industry	75	58	58	88	56	84	71	50
Per cent taking two industrial arts courses in addition to trade and industry	46	22	8	42	0	0	35	0

Opinions of Parents

Parents of trade and industrial students were asked to respond to twelve questions. The first question was intended to identify parental attitudes toward various occupations.

Parents were asked, "Without regard to problems such as finance, length of time in school, etc., what occupation would you like your son to go into?" Eight occupational areas were listed, and parents were asked to select one or to respond in a space labled "other."

There were four parents who "wrote in" occupations in the "other" space. All four were professions and were included in that group.

The occupation most desired for their sons by this group of parents was "automotive trades" as indicated by Table 70. The automotive trades was followed with one per cent less by the "professions." "Plumbing trades" was the lowest followed closely by "management" and the "wood trades."

Table 70. Occupational area desired by parents for their sons

Occupational Area	Percentages
Automotive trades (Auto body, Mechanic, etc.)	29
Professions (Medical, Law, Teaching, etc.)	28
Semi-professional (Draftsman, Pilot, etc.)	14
Metal trades (Welder, Sheet metal worker, etc.)	7
Electronic trades (Radio repairman, Electrician, etc.)	7
Wood trades (Carpenter, Cabinetmaker, etc.)	4
Management (Office manager, plant manager, etc.)	3
Plumbing trades (Pipe fitter, Plumber, etc.)	1
No response and other	7
Total	100

Parents were requested to respond to, "What type of student do you believe will benefit most from the trade and industrial program offered in the school your son is attending?" Those who responded to the four choices strongly favored the "average student" choice.

Table 71 indicated the choices provided and the responses to this question.

Table 71. What type of student benefits most from trade and industrial education

Type of Student	Percentages
Average students	77
Gifted students	7
Mentally slow students	5
Physically handicapped students	2
No response	9
Total	100

Parents were asked to respond to four statements to indicate what they believed would be the most value for the future that their son would receive from the trade and industrial program in which they were enrolled. Table 72 shows the choices provided and the responses in percentages.

The statement receiving the highest number of responses was "preparation for a trade or technical school." This was followed by "preparation for employment."

Table 72. Trade and industrial instruction of most value to students

Value	Per Cent
Preparation for a trade or technical school, such as Salt Lake Trade and Technical Institute.	37
Preparation for employment.	26
General education.	18
College preparation.	18
No response	1
Total	100

Parents were asked about the value of the program. It consisted of two related parts A and B. The first or A part is given in Table 73 along with the response. The question was asked, "Do you believe the instruction given is of a practical nature and is actually preparing your son to meet the problems he may face on the job?" Parents decisively replied that the trade and industrial program was preparing their sons for the problems they will face on the job.

Table 73. Trade and industrial instruction is of a practical nature for employment

Response	Per Cent
Yes	91
No	9
Total	100

The B part is show in Table 74. The question was "What do you believe is the best thing the program is doing for your son?" Three responses were requested in rank order using number one as first choice. Two columns of figures are shown in Table 74. The first shows the rank order of the over-all responses, and the second is a weighted number.

Parents, by a rather large number, believed that the best thing the program was doing for their son was "providing of technical knowledge." "Manipulative skills" was the item with the second high rating followed by "knowledge of industrial procedures, methods, and processes. It is interesting to note that "Teaching him good health and safety practices" was placed at the low end of the rank order.

Table 74. Knowledge that the trade and industrial program is providing for the student

Skills	Rank	Weighted Number
Providing technical knowledge.	1	187
Teaching him manipulative skills.	2	113
Providing knowledge of industrial procedures, methods, and processes.	3	95
Providing him with an interest in the industrial world.	4	84
Teaching him to be resourceful and creative.	5	55
Teaching him to work with others.	6	52
Holding his interest in school.	7	49
Teaching him to use materials and resources wisely.	8	44
Teaching him about new materials and new ways of using them.	9	30
Teaching him to interpret working drawings	10	27
Teaching him good health and safety practices.	11	12

Parents were asked as to their opinion about the degree of occupational education to be offered by the public school. Very few parents believe only the fundamentals (three r's) should be taught. The majority believed the public schools were responsible for general education including general knowledge of a trade or vocational area, while 18 per cent believed specific training should be given to prepare the student to enter employment.

Table 75 shows the statements and the responses to this question.

Table 75. Responsibility of the public school in reference to the training of workers for industry

Responsibility	Per Cent
Public schools are responsible for providing general education including general knowledge of a trade or vocational area of the students choice.	75
Public schools are responsible for providing training to qualify a person for a specific job in industry upon graduation from high school.	18
Public schools are responsible for providing the fundamentals (the three "r's" only).	7
Total	100

The parents were then asked if there were any trade and industrial courses which were not offered by the school that they believed should be available to the students. Sixty-three per cent of the parents said "there were not," and 23 per cent said "yes." Parents who said "yes" were asked to write in the name of the course. Most of the courses written in were given by only one parent. Exceptions to this included eight electronics, four mechanics, two plumbing, and two carpentry.

Parents were asked what they believed their son would be doing for the first two years after graduation. The largest number of students in a given area was 36 per cent intending to attend a university. This was followed by attending a trade or technical school. The choices given and the responses to them are presented in Table 76.

Table 76. Activities of students during the first two years after graduation

Activities	Per Cent*
Attending a college or university.	36
Attending a trade or technical school.	27
Fulfilling a mission for his church.	18
Employed in the field related to his trade and industrial training.	16
Serving in the Armed Forces.	13
Employed in another field.	5
Other, "undecided."	5

* The total of the percentages above exceed 100% because some multiple answers where the graduate planned to spend one of the two years in one way and the other in a second way.

Parents were asked whether there were other courses that they preferred that their son take rather than the trade and industrial course. Eighty-four per cent said "no," while seven per cent said "yes." Those who said "yes" were asked to name the courses other than trade and industrial courses. Business and biological sciences were courses most named by the parents.

The opinions of the parents regarding the improvement of trade and industrial courses are presented in Table 77. Fourteen per cent of the parents said "yes, the course needed improvement," thirty-one per cent said "no," and fifty-three per cent said "they did not know." Those who said "yes, improvement was necessary" were asked to select from five statements the one which applied. If none applied, they were to write in the recommended improvement. The only statement in the list supplied which did not receive a check mark was that students "need more safety instruction."

Table 77. Necessary improvement in the quality of trade and industrial instruction

Improvements	Breakdown of the 14 Per cent Yes Statements
Needs more associated instruction; such as, how to write a letter of application for employment.	4
More instruction should be given on industrial information; such as, the manufacturing processes used in industry.	3
Does not receive adequate instruction on the use and care of tools and machines.	2
Teacher needs additional training.	2
Other	3
Needs more safety instruction.	0
Total	14

Some of the responses in the "other" space were as follows: more reading, more math, more instruction, less work time, more equipment, class too large, teacher not certified, course revision, and more practical use of equipment.

Parents were asked to indicate what they believed was the physical quality of the trade and industrial shop their son was attending. Statements were made pertaining to five areas, and parents were requested to rate the condition as good, fair, poor, and no opportunity to observe. They were also asked to "write-in" any other conditions on which they wished to comment. There were no write-in comments.

The conditions receiving the greatest number of "good" responses, as indicated in Table 78, were "adequate teaching aids," and "adequate class space." This item was also one of the conditions which had only a few "poor" responses. "Proper ventilation and dust removal" received the highest number of poor responses.

Table 78. Physical quality of the trade and industrial facilities

	Number of Parent Responses in Percentages					
Facilities	Good	Fair	Poor	No Opportunity To Observe	No Response	Totals
Adequate teaching aids (Models, Projectors)	51	15	4	17	13	100
Adequate shop space	45	20	9	14	12	100
Quantity and quality of power equipment	41	23	3	18	15	100
Proper ventialtion and dust removal	42	14	10	16	18	100
Adequate class space	52	15	6	14	13	100

Parents were then asked to rank occupational areas on the basis of occupational opportunities, future training opportunities, etc. that are most important and hold the most promise for the future of the students in their community. Parents were asked to select four areas in rank order of importance. Twelve areas were listed and a space provided for writing in "other" areas. There were only three write-in responses and each was different; therefore, they are not presented.

According to Table 79, electricity/electronics was believed to hold the greatest opportunities for graduates of high school. Electronics was followed closely by auto mechanics. Building construction was third with approximately one-half the weighted value as electronics. Meat cutting, interior decoration, and vocational metals were on the low end of the scale.

Table 79. Opportunities in trade and industrial areas to students

Areas	Rank	Weighted Number
Electricity/electronics	1	289
Auto Mechanics	2	236
Building construction	3	150
Drafting	4	136
Machine shop	5	92
Welding	6	78
Auto Body	7	54
Commercial arts	8	37
Instrument repair	9	30
Vocational metals	10	19
Interior decoration	11	17
Meat cutting	12	4

The parents were also asked if they thought it was important for their son to graduate from high school. Ninety-nine per cent of the respondents said "yes" and 1 per cent "no."

Opinions of Administrators

In addition to the questions and responses of administrator and guidance personnel reported in the industrial arts section of the study, those administrators who had trade and industrial offerings in their schools were asked several questions which pertained only to the trade and industrial programs.

Six statements of purpose or possible objectives for trade and industrial education (not industrial arts) were given, and administrators were asked to rank them in order of importance. The general placement by rank was the same for both schools with and without trade and industrial programs. The purpose selected as most important was "the development of manipulative skills necessary for employment." The six statements, a weighted number, and a rank showing the relative importance position of each statement are shown in Table 80.

Another question asked administrators was, "From your knowledge of the graduating trade and industrial education students of your school, indicate what you believe the students of trade and industrial programs usually do during the first two years after graduation." They were asked to place in rank order four of the seven statements, using the number one as high rank indicating what they believed most of the students would be doing. Table 81 is presented to show the choices listed, a weighted number, and the relative position of each choice by rank.

Table 80. The purpose of trade and industrial education

Purpose	Rank Sr.*	Rank T&I**	Weighted Number Sr.	Weighted Number T&I
To develop manipulative skills necessary for employment	1	2	112	26
To provide occupational exploration to aid students in selection of a career	2	3	99	20
To provide technical knowledge and related occupation information	3	1	95	26
To develop personal and social traits essential to hold a job	4	5	57	5
To prepare for a vocational school such as Salt Lake Trade Technical Institute	5	4	33	19
To enrich other subjects	6	6	0	0

* Senior high schools without trade and industrial programs
** Senior high schools with trade and industrial programs

Table 81. Administrator's opinions as to what students of trade and industrial programs do the first two years after graduation

Activity	Rank	Weighted Number
They will serve in the Armed Forces.	1.0	26
They will be employed in a related field.	2.0	20
They will serve a mission for their church.	3.5	16
They will be employed in the field they are taking trade and industrial training.	3.5	16
They will attend a trade or technical school.	5.0	15
They will attend a college or university.	6.0	10
They will be employed in a field not related to their training.	7.0	7

The item "planning to be employed in the field in which they are not taking trade and industrial training," was not selected as first choice by any of the administrators and was the second choice of only two. The over-all rank when compared with the other six statements was 3.5.

"Serving in the armed forces," was selected as the most likely occupation of the graduates during the first two years after graduation. This was followed by "being employed in a related field." Attending a college or university was listed near the bottom. Gaining employment in a field not related to their training was selected least often by the administrators.

When asked how students are selected for trade and industrial classes, administrators indicated most frequently that, "students were not selected--the course was an elective." Table 82 shows the responses.

Table 82. Methods of selecting students for trade and industrial courses

Methods	Percentages*
Students are not selected in this area, it is an open elective.	67
Students are selected on the recommendation of the counselor after personal interviews.	56
Students are selected on the basis of high industrial aptitude as indicated from test results.	39
Students are selected because they are unable to succeed in academic-type classes.	17

*Percentages exceed 100% because some administrators checked more than one method.

The last question asked of the administrators was that they give their opinions about the reason or reasons students have for selecting trade and industrial courses. Preparation for employment was the reason selected most by administrators followed by "preparation for trade and technical school." The reason selected least often was that the students expected an easy credit. The responses are shown in Table 83.

Table 83. Reasons students register for trade and industrial courses in the opinion of administrators

Reasons	Percentages*
Preparations for employment	95
Preparation for trade and technical school	89
Recommendations of school counselor	72
A well liked teacher	35
Parent's wishes	28
Easy credit	11

* Percentages total exceed 100% because of multiple selection by administrators.

Opinions of Industrial Management

Opinions of industrial management concerning the purpose of trade and industrial education in the high schools are shown in Table 84. "Providing technical knowledge and related occupational information" was ranked the highest. "Enrichment of other subjects" ranked significantly low.

Table 84. Opinions of industrial management concerning the purpose of trade and industrial programs in high schools

Opinions	Rank	Weighted Number
Provide technical knowledge and related occupational information.	1	39
Provide occupational exploration to aid students in selection of a career.	2	34
Develop manipulative skills necessary for employment.	3	30
Prepare for a vocational school; such as, Salt Lake Trade Technical Institute, Utah Trade Technical Institute, etc.	4	21
Develop personal and social traits essential to hold a job.	5	12
Enrich other subjects.	6	6

When asked to indicate the changes that should be made in the trade and industrial curriculum as a result of anticipated changes in industry, the industrial management people, as revealed in Table 85, believed that several areas should receive some attention; there should be more opportunities for students to develop problem solving skills. This was checked by 83 per cent of the respondents, while 78 per cent indicated the courses should be practical in nature including industrial processes and materials.

Table 85. Anticipated industrial changes and the effect on trade and industrial curriculum

Curricular Changes	Per cent*
More opportunity to develop problem solving skills relating to industrial materials and processes which stimulate creative thinking.	83
Courses should be more practical in nature. (Courses which deal with industrial processes and materials)	78
More courses which center around scientific and mathematical experiences.	65
More courses which concentrate on manipulative skills.	61
Courses should be more highly specialized.	30
Curricular offerings should be more general in nature.	4
Other	4
No changes, present curriculum offerings will meet the needs of the future.	0

* Per cents exceed 100% because of the multiple selection by respondents.

According to Table 86, sixty-one per cent of the respondents believed that the major emphasis of a trade and industrial program at the high school level should be on technical knowledge.

Table 86. Where emphasis should be placed in high school trade and industrial education according to industrial management people

Emphasis	Responses Per Cent
Technical Knowledge	61
Manipulative Skill	39
Total	100

As shown in Table 87, all of the respondents from industrial managements stated that the public schools do have a responsibility of providing some type of vocational education at the high school level.

Table 87. Public school's responsibility for providing trade and industrial education in the high school

Response	Per cent
Yes	100
No	0

Table 88 indicates that industrial management people think the areas offered in a high school trade and industrial program should be; first, "electronics and electricity," second, training in the "metals" area, and third, "drafting."

Table 88. Areas in which industrial managements thought schools should provide trade and industrial programs on the high school level

Industrial Arts Areas	Per cent*
Electricity/electronics	91
Metals	83
Drafting	78
Automotive	52
Woods	39
Graphic Arts	26
Other	2

* Percents exceed 100% because of multiple selection by respondents.

In response to the question, "Should trade and industrial courses at the high school level be preparatory or terminal," 91 per cent of the industrial management people, as shown in Table 89, were of the opinion that these classes should be preparatory for the future training.

Table 89. High school trade and industrial program as preparatory or terminal education

Purpose	Per cent
Preparatory	91
Terminal	9
Total	100

It is significant that 71 per cent of the respondents state, as shown in Table 90, that they believed the "trade and industrial programs should be organized to include actual on-the-job work time in cooperation with local industry."

Table 90. Opinions of industrial management concerning "cooperation on-the-job work time"

Response	Per cent
Yes	71
No	22
No reply	7
Total	100

In response to the question of the type of equipment and facilities that should be provided for a trade and industrial program, the majority of industrial management respondents, as shown in Table 91, believed that the tools and equipment should be the same as those found in industry.

Table 91. Equipment and facilities that industrial management thought should be provided for trade and industrial education programs in high schools

					Opinions of how well schools are currently equipped in these areas.			
Statements	Strongly agree	Agree	Disagree	No opinion	Good	Fair	Poor	No opportunity to observe
	Percentages*				Percentages*			
Tools and equipment should be the same as found in industry.	22	57	13	4	9	30	17	22
Light weight models (not actual production models) should be used as representatives of industry to teach skills.	13	43	22	9	0	22	17	35
Students should learn basic skills in school shops, but receive actual training on production equipment in industry.	26	30	30	4	4	26	17	26
Mass production techniques, facilities and equipment as used in industry should be stressed.	22	35	26	9	4	4	35	35

*Percentages do not total 100% because some respondents failed to mark any item.

It will be noted that industrial management, according to Table 92, considered nearly all of the trade and industrial areas as either very important or important. However, in response to how well they thought the schools were currently doing in these areas, most of them indicated either fair or poor.

Table 92. Opinions of industrial managements concerning areas that should be stressed in trade and industrial education at high school for the student to be able to enter into employment

					Opinions of how well the schools are currently doing in these areas.			
	Very Important	Important	Not Important	No Opinion	Good	Fair	Poor	Could Not Observe
Areas	Percentages*				Percentages*			
Manipulative skills	35	61	4	0	17	43	22	9
Technical skills	35	65	0	0	4	52	26	4
Information about industrial processes and materials	17	70	17	0	0	30	39	13
Information about occupational opportunities	39	52	4	0	13	52	13	9
Development of problem solving skills relating to materials and processes	48	39	9	4	9	35	26	17
Development of desirable personal and social traits	48	35	0	9	9	35	30	9
Other	4	0	0	0	0	0	4	0

* Percentages do not total 100% because some respondents failed to mark any item.

The trade and industrial programs, as revealed in Table 93, are meeting the needs of students in getting and holding a job best in the "use of hand tools." It is significant to note that in the opinion of industrial management, programs are not meeting the "needs" in many other areas.

Table 93. Opinions of industrial management concerning adequate trade and industrial education programs in meeting the needs of students in getting jobs

Opinions	Present programs meet needs of student Per cent* Yes		No Opportunity To Observe	Areas should be included in trade and industrial programs Per cent* Should	
	Yes	No		Should	Should Not
1. Preparation in the use of power tools relating to the trade.	22	44	26	83	9
2. Preparation in the use of hand tools relating to the trade.	57	13	22	87	4
3. Training in the area of industrial processes; such as, mass production and other manufacturing procedures.	0	74	17	61	26
4. Information about industrial materials; such as, stell, woods, plastic, etc.	35	39	22	87	4
5. Information about occupational opportunities; such as, where jobs are available, the training required, specific duties, etc.	30	48	13	87	0
6. Information about how to prepare letters for application for employment.	9	65	13	87	0
7. Information about how to prepare themselves for an interview.	13	65	9	78	0
8. Information about fringe benefits; such as, workman's compensation, sick leave, retirement, etc.	13	57	17	48	39
9. Information about the relationship of union to management.	13	61	13	61	22
10. Information about union organization; such as, dues, benefits from belonging, etc.	13	61	13	52	35
11. Information about how to work with others, such as foreman and co-workers.	13	61	13	0	8

*Percentages do not total 100% because some respondents failed to mark any item.

The industrial management people, as shown in Table 94, have placed the counselor in a responsible position in the selection of students for the trade and industrial programs. They have also indicated that students should not be merely "selected because they couldn't succeed in academic-type classes."

Table 94. Opinions of industrial management concerning how students should be selected for trade and industrial classes

Criteria	Per cent*
Selected on the recommendation of the counselor.	65
Selected on the basis of high industrial aptitude.	52
Students should not be selected in this area. It should be elective.	22
Selected because they are unable to succeed in academic-type classes.	17
Other	9

* Per cents exceed 100% because some respondents selected more than one statement.

A majority of the respondents to the industrial management instrument do not believe the public schools have a responsibility for retraining of adults for industrial positions, as shown in Table 95.

Table 95. Opinions of industrial management concerning public high schools providing adult retraining programs

Response	Per cent
Yes	46
No	54
Total	100

Those who answered "yes" to the question pertaining to the retraining of adults were then asked to select the programs they believe should be offered from a list of four types. Table 96 presents responses to this question.

Table 96. Adult industrial retraining programs considered to be best by industrial management

Type of Program	Per cent
Extension courses (evening classes) for employed adults held during non-working hours.	48
Cooperative courses (part-time classes) for employed adults which may be held during working hours, a joint effort with industry.	17
Supplementary training provided for job up-grading, or foreman training.	17
Trade preparatory courses (all day trade classes) for post high school youth and adults leading to employment in industry.	4
Other	0
No response	14
Total	100

As indicated in Table 97, sixty-five per cent of the respondents believed that as new courses are added, they should include "manufacturing processes." Sixty-one per cent would like to see a course in "numerical control" in the program.

The respondents from industrial management were asked to indicate some of the basic hiring requirements their company had concerning such items as minimum education, scholastic achievement, references from school and previous employers, test scores, previous work experience, and minimum age. These items have been listed, and the tabulated responses have been indicated in Tables 98, 99, and 100. It should be noted the wide variation of formal school requirements that the various industries require. Those companies that hire draftsman and electronic technicians ranged from "no requirements" up through "trade school," "technical school," through "four years of college."

Table 97. New trade and industrial courses industrial management thought the high schools should introduce into the curriculum

Courses	Per cent*
Manufacturing Process	65
Numerical Control	61
Metals Industries	52
Power Mechanics	52
Aero-Space Technology	39
Wood Industries	22
Other (Quality control, elect.)	13

* Per cents do not total 100% because some respondents listed several courses.

Another item worthy of noting is the per cent of industries that utilize the grades a person receives as well as the vocational courses he had taken.

There appears to be a conflict of thinking between amount of formal schooling required and the preferred minimum age required.

Table 98. Education required by industrial managers for entry into selected trades

	Number of Respondents									
	Minimum Formal Education						Trade School Is Required		Trade School Is Required	
			Post High School							
	None	High School Graduate	1 Yr.	2 Yr.	3 Yr.	4 Yr.	Yes	No	Yes	No
Auto mechanics	1	2	0	0	0	0	1	1	2	0
Bricklaying	1	0	0	0	0	0	0	1	0	1
Cabinet making & mill work	0	1	1	0	0	0	1	1	1	1
Carpentry	0	6	0	0	0	0	4	3	0	3
Drafting	0	5	3	4	0	4	6	5	11	4
Electricity/electronics	0	7	2	4	1	1	3	3	8	3
Electrical trades	0	10	0	1	0	0	6	5	4	5
Machine trades	1	10	2	0	0	0	8	6	3	7
Plumbing	0	8	0	0	0	0	4	4	0	6
Sheet metal & furnance work	0	6	0	0	0	0	3	3	0	3
Welding	1	13	0	0	0	0	11	5	2	8
Total	4	68	8	9	1	5	47	37	31	41

Table 99. Opinions of industrial managers concerning hiring personnel

Trades	Number of Respondents														
	Minimum Trade Experience Required						Minimum Age Preferred							Physical Examinations Required	
	Years						Years								
	0	1	2	3	4	5 or More	16	17	18	19	20	21	22	Yes	No
Auto mechanics	0	0	1	1	0	0	0	0	1	1	0	0	2	2	0
Bricklaying	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0
Cabinet making & mill work	1	0	1	0	0	0	0	0	2	0	0	0	1	3	1
Carpentry	0	2	1	0	1	1	0	0	3	0	0	2	2	6	1
Drafting	2	6	3	0	9	1	0	0	7	0	0	0	3	13	3
Electrical trades	2	2	2	1	3	1	0	0	3	1	0	4	3	12	1
Electronics	4	2	1	1	1	2	0	0	4	1	2	2	2	12	1
Machine trades	2	3	2	1	4	1	0	0	5	0	2	4	3	10	4
Plumbing	1	1	1	1	2	0	0	0	2	0	0	3	3	7	0
Sheet metal and furnace work	1	1	1	0	1	0	0	0	3	0	0	2	1	6	0
Welding	1	4	5	1	2	1	0	0	5	0	2	5	3	14	3
Total	14	21	18	6	24	7	0	0	35	3	6	22	24	86	14

Table 100. Opinions of industrial managers concerning hiring personnel

	Number of Respondents											
	Utilization of High School Scholastic Record					Utilization of Written References				Utilization of Employment Tests		
			If yes, the areas of most interest			Character		References from Previous Employer		General Aptitude Test Battery		Other Tests
Trades	Yes	No	Academic Classes Taken	Vocational Classes Taken	Grades Received	Preferred	Required	Desired	Required	Desired	Required	
Auto mechanics	1	1	0	0	0	0	0	1	0	0	0	0
Bricklaying	0	1	0	0	0	0	0	1	0	0	0	0
Cabinet making & mill work	0	1	0	1	1	2	0	1	1	0	2	1
Carpentry	3	2	0	4	3	4	2	3	3	0	6	1
Drafting	8	8	3	5	7	7	8	9	7	2	7	2
Electrical trades	8	5	1	8	6	7	5	6	7	1	9	2
Electronics	6	5	1	5	6	4	5	6	5	1	10	1
Machines trades	6	7	0	7	2	8	5	8	5	1	10	2
Plumbing	3	4	0	4	2	4	3	4	4	1	7	1
Sheet metal & furnace work	4	2	0	4	3	4	2	3	3	0	5	2
Welding	8	7	0	7	5	10	6	8	6	4	9	2
Total	47	43	5	45	35	50	36	50	41	10	65	14

TRADE AND INDUSTRIAL PROGRAM EVALUATION

The trade and industrial program evaluation instrument was completed during an interview and observation period. The first section of this instrument contained nine questions pertaining to advisory committees. It was found, as noted in Table 101, that advisory committees for trade and industrial education at the high school level are virtually nonexistant in the state. The ninth question shows that consultation with other industrial interests is also lacking.

Table 101. Advisory committees

Statements	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
There is an active representative advisory committee	86	0	0	7	7
There is an active trade advisory committee for each trade or occupation.	86	0	0	7	7
Advisory committee members are informed.	86	0	0	11	3
An agenda is prepared and followed for committe meetings.	86	0	4	7	3
Public interest and support is obtained by representative advisory committees.	86	0	0	3	11
The number of meetings held and attended are indicative of interest on part of members.	86	0	4	7	3
There is adequate management by the program administrator in order to insure effective committe service.	89	0	0	11	0
The service rendered by advisory committees is given public recognition.	86	0	3	11	0
School supervisors regularly consult other industrial committees; such as, apprenticeship committees, plan superintendents, etc.	93	0	4	3	0

The second section consisted of ten questions dealing with program improvement. Responses to these questions are presented in Table 102. Within the area of continuing program improvement, "guidance for the student" received the highest percentage of unsatisfactory responses. When the programs were evaluated, 54 per cent of the trade and industrial teachers believed their school's guidance programs were unsatisfactory. Only seven per cent believed their guidance programs were superior. The area which was second highest in this unsatisfactory category pertained to the support of the administrative and supervisory staff in implementing suggestions. There were 25 per cent who believed unsatisfactory conditions existed. However, this question, though it received the second highest number of unsatisfactory responses, received the second highest number of superior responses within the area of program implement. Two areas tied for the third high position in the superior category were the items dealing with supervising and meeting the needs of industry. Safety was the item with the highest percentage of superior responses.

Table 102. Continuing needs of the training program

	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
Statements	Percentages				
An organized, functioning supervisory system exists for the improvement of the program.	15	0	21	43	21
Course work is matched to the needs of workers in industry.	11	0	18	50	21
Advisory committee and industrial contact suggestions are encouraged and implemented when advisable.	89	0	4	7	0
Graduate follow-up records are kept and suggestions for improvement sought.	86	0	7	7	0
Administration encourages suggestions and implements those which are desirable.	11	0	25	21	43
The program is expanded in proportions similar to industrial expansion.	57	0	0	28	15
Records of service and coverage of adult courses show an increase.	71	0	0	18	11
There is an organized and adequate system in the secondary school for guidance of students.	11	0	54	28	7
Placement of trade and industrial graduates through direct requests have been increased.	17	0	21	25	7
The accident record had been improving through a planned prevention program.	22	0	0	7	71

The third section of the evaluation instrument pertained to the course objective and content. Answers to eight questions were sought. Responses to the eight questions are presented in Table 103. As in the previous section, which pertained to program improvement the question dealing with safety received the highest number of superior responses. The two high ratings for unsatisfactory conditions were "preparing a complete course of study in units with time required to complete each unit" and "instruction is based on a course of study."

As indicated in previous sections, there is a lack of advisory committees. This is again reflected in question No. 3 of this section. In 68 per cent of the schools, committees did not review the course of study.

Table 103. Program improvement relating to course objectives and content

Objectives	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Well defined course objectives.	0	0	7	47	46
2. Complete course of study including time tables.	3	0	15	57	25
3. Advisory committee reviewed and approved course of study.	68	0	11	18	3
4. Periodic revision of course of study.	28	0	7	50	15
5. Instruction based on course of study.	3	0	15	50	32
6. Required achievement levels are set for students	0	0	11	46	43
7. The course of study is organized on a short unit basis	10	0	11	43	36
8. Safety practices and methods are emphasized	3	0	0	32	65

General physical provisions were covered by eleven questions in the next section of the instrument. Statements pertaining to these provisions and results obtained during the interview schedule are shown in Table 104.

The provisions which was most satisfactory pertained to "sanitary provisions; such as, drinking fountains, toilet, and washing facilities which are suitable to the activity." This was followed by "well kept walls, ceiling, and floor."

Table 104. General physical provisions

Provisions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. The building is a suitable structure for the particular course.	0	0	18	39	43
2. The space in the building is well utilized.	0	0	21	36	43
3. The space is well adapted to the activity.	0	0	29	39	32
4. Entrance and exits are suitable and well utilized.	0	0	4	57	39
5. Instructional space is adequate.	0	0	18	43	39
6. Instructional space is well heated and ventilated.	0	0	7	47	46
7. Lighting is adequate for the activity.	0	0	14	50	36
8. Space for storage of supplies, materials, & small equipment is adequate and suitable.	0	0	32	32	36
9. Walls, ceiling, and floor are in good repair.	0	0	18	28	54
10. Sanitary provisions; such as fountain, toilet, etc. are suitable for activity	0	0	14	32	54
11. Fire extinguisher, first aid kit, etc, for safety and first aid are provided.	0	3	11	50	36

The provision from the list of eleven which was the most unsatisfactory was the one dealing with "storage space for supplies, materials, and small or moveable equipment." For this particular provision, 32 per cent of the schools visited had unsatisfactory conditions. Another provision with a fairly low rating was Item No. 3 pertaining to "how well the space was adapted to the activity."

The fifth section was designed to ascertain the status of instructional physical provisions.

The ten questions dealing with instructional and physical provisions and the results are shown in Table 105. It will be found, that in general, all provisions listed received a large percentage of satisfactory and superior responses.

Table 105. Instructional physical provisions

Provisions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Individual instruction space is adequate.	0	0	18	54	28
2. Equipment for individual instruction and practice is adequate, modern, and well located.	0	0	21	72	7
3. Instructional supplies are adequate and obtained without difficulty.	0	0	36	43	21
4. Group instruction, demonstration, and planning space is suitable.	7	0	25	36	32
5. There are provisions for visual instruction; such as charts, models, projectors, screens, etc.	0	0	32	40	28
6. Suitable materials are available to provide individual instruction for all parts of the course.	0	0	39	43	18
7. There are provisions for aiding the teacher in preparing instructional materials.	11	0	36	39	14
8. A reference library is provided and usable.	25	0	28	36	11
9. Condition and use of instructional equipment are conducive of effective instruction.	3	0	29	54	14
10. Good housekeeping receives major attention.	0	0	21	50	29

Table 106 shows the percentages of responses for questions pertaining to instructional methods and management. The item showing the greatest need for improvement was

No. 12, pertaining to the keeping of records showing the educational and work experience, attendance, and achievement of the student. Only three per cent of the schools were rated superior in this respect, while 29 per cent kept no records at all. Ratings given Item No. 6 show that students are making inadequate use of reference materials. Eighteen per cent of the schools do not have a source of reference materials within the instructional areas, and 28 per cent had conditions that were unsatisfactory. The most satisfactory condition, item number 7, was "keeping all students busy at a definite assignment."

The seventh major section of the interview instrument was designed to determine instructional and other special conditions or provisions for shop and laboratory courses. The evaluation is shown in Table 107.

"Using work assignment cards to give students instruction," Item No. 7, is done in a superior manner by 29 per cent of the teachers, but this is also the item with the highest percentages in the "does not exist column."

Item No. 3 is another area which appears to require attention. A shop personnel organization does not exist in 18 per cent of the programs. Though this percentage is not high and 82 per cent of the programs do use personnel organizations, there were only 42 per cent with a superior rating. This represented the lowest items in the superior rating category. It was followed by provisions for the display of student work with only 18 per cent in the superior category. The remaining items covered by the instrument within this section appear to be quite satisfactory and are nearly all equal in quality.

Table 106. Instructional methods and management

Methods	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Instruction is planned in terms of outlined course content.	3	0	4	61	32
2. Instruction is presented according to a definite plan to meet student needs.	0	0	4	57	39
3. Instruction is adapted to the individual needs of the student.	4	0	0	57	39
4. Teaching methods are consistent with best practices.	4	0	0	71	25
5. Charts, models, mock-ups, and films are used.	3	0	11	57	29
6. Students make frequent use of available reference materials.	18	0	28	36	18
7. All students are busy at a definite assignment.	0	0	3	54	43
8. Assignments are specific and clearly indicated.	4	0	7	50	39
9. Assignments have definite value pertaining to the occupation.	4	0	7	50	39
10. New assignments are anticipated in advance.	7	0	7	57	29
11. Instruction is co-ordinated with other occupational and school activities.	4	0	4	7	21
12. Student records showing performance, attendance, and progress are maintained.	29	0	29	39	3

Table 107. Instructional and other special conditionsor provisions for shop or laboratory courses

Conditions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Work assignments are based on similar work done in industry.	3	0	7	54	36
2. Work methods are similar to methods used in industry.	3	0	7	54	36
3. Personnel organizations in the laboratory are similar to that used in industry.	18	0	18	50	14
4. Individual and group activities are conducted in connection with work assignments.	14	0	0	50	36
5. Machines and other equipment meet industrial standards.	0	0	32	46	22
6. Instructional materials on machines, tools, etc. are available and used by individual students.	6	0	18	40	36
7. Work assignment cards, containing specifications, etc. are available and used by individual students.	28	0	14	29	29
8. The quality of work done is good and in keeping with industrial practices.	0	0	7	64	29
9. Emphasis is placed on speed of production and completion of assignments.	3	0	11	50	36
10. Students are properly dressed for work.	0	7	14	43	36
11. Tool rooms are maintained and used according to the best industrial practices.	14	0	25	29	32
12. Teacher headquarters are properly located and equipped.	7	0	29	28	36
13. There are provisions for displaying student work.	7	28	36	11	18

The eighth section pertained to health and safety. Twelve items pertaining to the shop were reviewed and are presented in Table 108. The figures shown are percentages of programs which received that particular rating. The evaluation also may be seen in Table 108.

"The participation of students in safety inspection" and the "use of acceptable accident reporting forms" were two other areas high in the "does not exist" column.

"The type of floor being suited to the work to be done" received the highest superior rating followed by "emphasizing safe practice," with 89 per cent of the programs in the satisfactory and superior categories.

None of the programs reviewed received a superior rating on the three items pertaining to traffic. These items were: (1) Markings on the floor to identify work stations, (2) Markings on the floor to identify safety lanes for traffic to follow, (3) The use of guard rails to protect prohibited areas. This last item, however, did not apply in more than one-half of the cases.

Table 108. Special shop or laboratory conditions or provisions related to arrangement of equipment, safety, and health

Conditions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Stationary equipment is well arranged.	3	0	29	32	36
2. Satisfactory work stations are marked on the floor.	25	21	36	18	0
3. No crowding or interference in material handling.	4	0	32	39	18
4. There is an effective exhaust system.	7	25	14	25	29
5. Proper safety guards are provided.	4	21	11	32	32
6. Safety guards or appliances are used.	4	14	7	39	36
7. The floor is suited to the work.	0	3	11	32	54
8. Safety lanes are well-marked, and followed.	32	32	25	11	0
9. Guard rails protect prohibited areas.	21	57	11	11	0
10. Safe practices are emphasized.	11	0	0	46	43
11. There is an organized safety inspection provision participated in by the students.	29	0	14	36	21
12. Accident reporting conforms to National Safety Council Standards.	32	0	11	25	32

The next section contained statements concerning special conditions and provisions relating to students and activities in secondary schools. Data received in this section is presented in Table 109.

The provision appearing to be the most satisfactory was having adequate locker space for students. All programs had lockers with 43 per cent in superior condition. There were, however, 32 per cent of the schools with unsatisfactory locker conditions.

Table 109. Special conditions and provisions relating to students and activities in secondary schools

Conditions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. The teacher and guidance personnel cooperate in the selection of students who will profit from instruction	4	0	39	39	18
2. For cooperative courses practical work is designed to develop occupational competency	83	0	3	14	0
3. There is a follow-up of graduates in cooperation with guidance personnel, teachers, and employers.	68	0	25	7	0
4. Placement records and the graduates record with employers is satisfactory with the standpoint of the training received in school	72	0	14	14	0
5. The curriculum provides a well-rounded education for work and living	11	0	7	50	39
6. Practical and related instruction are coordinated both as to content and timing	4	0	7	50	39
7. There is opportunity for participation in extra curricular activities of the school	4	0	32	39	25
8. Trade and industrial students participate in extra curricular activities	0	0	36	36	28
9. There is adequate student locker space	0	0	32	25	43

"Cooperative courses which combine work experience on a part time basis with schooling," Item No. 2, appears nearly to be non-existant. In 83 per cent of the schools, programs of this nature did not exist. None of the schools received a superior rating. Item No. 3, dealing with the cooperation with guidance personnel and employers regarding the follow-up of graduates, notes that none of the schools was operating under superior conditions, and 68 per cent had no follow-up program whatsoever. "Maintenance of placement records and record keeping of the graduates progress in employment" was also in the same low category as Item No. 3. None of the programs received a superior rating, and records were not kept in 72 per cent of the schools. This information may be seen in Table 109.

There were four items pertaining to the vocational supervisory staff which made up the next section of the instrument. Table 110 shows the percentages within each rating.

"Obtaining of materials and supplies, " Item No. 3, was the item which received the highest rating with 18 per cent in the superior category and 54 per cent satisfactory.

"Program reports were not sent to administrators," Item No. 4, in 72 per cent of the schools, and none of the schools received a superior rating on this item.

A section containing three items pertaining to "determining the community needs" was included in the instrument. Rating in this section was very low. All three items received very high percentages in the non-existant column, while none of the three were high in the superior column. The information obtained is presented in Table 111.

Table 110. Vocational supervisory staff

Statements	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Program objectives, duties, responsibilities and cooperative relationships of personnel are clearly defined and understood	7	0	21	68	4
2. There is a well-planned and activated program of supervisory visits	11	0	39	39	11
3. Suitable instructional materials and supplies are made available	3	0	25	54	18
4. A statistical and summary report is made each month to the chief administrator	72	0	21	7	0

Table 111. Determining community needs for training programs

Community Needs	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. Management and labor are consulted pertaining to course offerings for training for industrial occupations.	75	0	14	7	4
2. Industrial contact channels are maintained pertaining to training services available.	65	0	14	14	7
3. Needless duplication is avoided by coordination activities between near-by school districts.	57	0	18	14	11

Administrative support was evaluated in the next section. The nine items covered are presented in Table 112.

The area of greatest concern appears to be Item No. 6. The supervisor does not have enough assistance. In 11 per cent of the schools, assistants did not exist in any degree, while 32 per cent had unsatisfactory conditions. Only seven per cent of the schoools indicated superior conditions relating to supervisory help to meet the administrative, supervisory, and coordination requirements of the program.

The most satisfactory condition in this section concerned a mutual respect between general education and trade and industrial teachers (Item No. 8). There were 57% of the schools rated as superior and only 11% as unsatisfactory. The relationship between trade and industrial and industrial arts programs, however, was not as good. In this case, there were 25 per cent of the schools in the unsatisfactory category.

Upon scheduling visits to each program, it was learned that over one-half of all the state's trade and industrial programs were held as an extension to the regular school day. Some were held one hour before or after school; but in the case of 13 programs, the entire three hours were in addition to the school day.

Table 112. Trade and industrial teachers opinion of the support of vocational programs by school administrations

Opinions	Does Not Exist	Does Not Apply	Unsatisfactory	Satisfactory	Superior
	Percentages				
1. The board of education and central office provides adequate financial support for the trade and industrial program.	4	0	14	50	32
2. It is possible to obtain necessary supplies and instructional materials for effective instruction.	3	0	25	54	18
3. Administrative policies, regulation, and fiscal considerations permit the fulfillment of needed training services.	4	0	3	50	43
4. The trade and industrial supervisor is responsible for public relations, approving and arranging for new courses, or discontinuance of old courses, coordination with industry and providing instruction for trade and industrial training.	7	0	18	46	29
5. The supervisor has authority, or can obtain it without undue delay, to act within the scope of his responsibility.	7	0	14	61	18
6. The supervisor has sufficient assistants.	11	0	32	50	7
7. Good administrative cooperation exists between the general education and trade and industrial programs.	0	0	18	32	50
8. Mutual respect exists between general education and trade and industrial teachers.	0	0	11	32	57
9. There is a good relationship between industrial arts and trade and industrial education.	0	0	25	36	39

TEACHER QUALIFICATIONS

Twenty trade and industrial teachers completed and returned the evalutation instrument dealing with teacher qualification. Fifteen of the twenty had obtained BS Degrees. Six teachers holding BS Degrees had no industrial work experience in the field in which they were teaching. Two had one year's experience and two had two years. Only five out of the fifteen had three or more years experience in addition to professional training terminating with the BS Degree.

Five out of the twenty did not have a BS Degree, but all had six or more years of industrial experience.

Table 113. Industrial experience of trade and industrial teachers

	Number of Teachers					
	With BS Degree Years of Experience				Non-Degree Years of Experience	
	0	1	2	3 or more	Less than 6	More than 6
	YEARS				YEARS	
Industrial Experience	6	2	2	5	0	5

SUMMARY

Program Offerings and Future Plans

Industrial arts

Some type of industrial arts offerings is available to students in all secondary schools in the forty districts of the state. None of the junior high administrators who returned instruments indicated that additional course offerings in industrial arts were being planned. However, as noted in the findings, some administrators believe two areas should be offered which are not now presently included because of the lack of qualified teachers. These areas were general metals and electricity. The major reason given that essential course offerings are not made available at the junior high level is, "inadequate shop space."

The only industrial offering believed adequate by junior high administrators was the area of general woods.

Offerings at the junior high school level consist of one required unit. Students usually take one-half unit for two years. Over one-half of the junior high students enrolled in industrial arts are taking the course as an elective which indicates that greater than 50 per cent of the students receive more than one unit at the junior high level.

Only twenty per cent of the senior high administrators believe additional offerings are needed in addition to those indicated above. As at the junior high level, the lack of shop space is the major problem preventing desired courses being offered. In addition to this, lack of funds appears to be a major problem.

Trade and industrial

There were 38 trade and industrial courses being offered during the school year 1964-65 in the public secondary schools of Utah. These offerings were made in 13 school districts. Nine subjects were taught: carpentry, auto mechanics, drafting, machine shop, welding, electronics, vocational metals, auto body, and meat cutting. Fifteen of the 38 offerings were auto mechanics courses.

Only eleven per cent of the senior high administrators stated they believed public schools did not have a responsibility to provide trade and industrial programs in the high school. In most districts, offerings are very incomplete. The major reason appears to be the lack of funds. By far the most frequently given reasons were lack of funds and lack of facilities; and, of course, facilities require funds. The lack of trained teachers was not a prime reason given by administrators for not providing what they considered needed courses. However, the teacher personnel evaluation sheet filled out by trade and industrial teachers indicated that a large percentage are not qualified. Many who have had industrial experience are teaching trade and industrial subjects outside the field of their experience.

Objectives

Industrial arts

The purposes of industrial arts are not deemed the same by students, parents, teachers, administrators, and industrial management. Close similarities in thinking are found among parents and industrial management, but their opinions do not agree with school people. The teachers and administrators view the objectives in much the same light.

Teachers and administrators rate "to develop in each student a measure of skill in the use of common tools and machines" as the most important objective unique to industrial arts. On the other hand, parents and industrial management rate as the most important objective "to discover and to develop creative technical talents in students." Students listed "to help students select an occupational field" (guidance) as the most important purpose of industrial arts.

An objective with sufficient difference of opinion to cause concern and deserve further study is, "to provide vocational training for students who would not otherwise have this opportunity." This objective was listed tenth by the junior high school teachers and eighth by the senior high school teachers. It was rated a little higher in importance by administrators, seventh and eighth by junior and senior high school administrators respectively. Industrial managers who must be responsible for the employment of these youth rate this second in importance. Senior high school students also ranked this objective near the top of the list in the 2.5 position.

It is commonly accepted that the high school curriculum is largely college entrance oriented; yet many of the high school graduates will be employment bound at graduation. Industrial management indicate by their ratings that the public schools should hold the objective of preparing these youth for work as highly important.

An objective opposite in nature to the vocational objective is "to develop worthy leisure-time interests." The response to this objective was also opposite in nature. The junior high school teacher and administrators rated this fifth and second in importance, respectively; while the senior high school teacher and administrators rated it tenth and fourth, respectively. Industrial management and administrators with trade and industrial programs in their schools believed this to be relatively unimportant by rating it at ninth position.

In comparing how well various groups believe these objectives are being met in the public school, it may be noted that administrators of the junior and senior high schools rate as first "to develop in each student a measure of skill in the use of common tools and machines." Industrial management, however, believe the schools are providing general all-around technical knowledge inasmuch as they rated this first.

Trade and industrial

Approximately 45 per cent of the students of trade and industrial programs and 37 per cent of their parents state that the main objective or purpose of a trade and industrial program at the high school level was to "prepare a student to go on for further training at a vocational or technical school."

In contrast to the above opinion of the students and parents, the administrators of high schools where there were trade and industrial programs being taught as well as those who responded for industrial management, ranked "the development of manipulative skills necessary for employment" as the main objective or purpose of trade and industrial programs at the high school level.

Value of Industrial Education Programs

Industrial arts

Students, parents, and administrators all believed industrial art to be of most value to future skilled workers and technicians. Administrators as a group believe drafting to be the most important as far as opportunities to the graduates of their schools. They placed graphic arts the lowest in importance on the list of course area offerings. This is a subject area receiving little attention in this geographical area. Graphic arts was selected even less than "write-in" responses in the "other" space. Throughout the study when graphic arts appeared in any of the instruments, it received the least response as to any needs or value.

Seventy-one per cent of the junior high school and sixty-four per cent of the senior high school students' parents indicated that they wanted their son to take the industrial arts course in which they were enrolled. Parents selected as the most valuable objective, "to discover and develop creative technical talents in students." The course area considered of most value by industrial management was electronics followed by drafting and machine shop. Woodwork and crafts were considered of least value.

All groups, the students, parents, and administrators strongly indicated by their answers that industrial arts is of most value to students with average ability.

Trade and industrial

Students of trade and industrial programs saw the value in the course since 82 per cent said the choice of enrolling was their own and not their parents. The largest number of students thought the trade and industrial program was of most importance for preparation for vocational or technical school. They indicated that the most value they received from the course was obtaining skill in using the tools of the trade.

Parents indicated the best thing the program was doing for their son was "providing technical knowledge," followed by "teaching him manipulative skills," and "providing knowledge of industrial procedures, methods, and processes." Parents thought the trade and industrial program was of most value for students to "prepare for a trade or technical school," and second "preparation for employment." Only 14 per cent of the parents said the trade and industrial course in which their son was enrolled needed improvement. Industrial management respondents indicated, as a value to be obtained, the greatest emphasis should be placed on the gaining of technical knowledge rather than manipulative skill. To indicate that they believed the trade and industrial program to be of value, 100 per cent of the industrial management respondents said that the public schools should offer trade and industrial programs.

All groups, the students, parents, and administrators strongly indicated by their answers that the trade and industrial program is of most value to students with average ability.

Reasons Students Select Industrial Education Courses

Industrial arts

Students and administrators indicate the main reason for the students enrolling in industrial arts was "they like to work with their hands." Administrators and junior high school students chose as the second reason "they wanted to make projects," while the senior high school students chose "to prepare for a vocation." "I plan to get a job in the course" was also frequently selected by students. Junior high school administrators indicated they thought students took the course because friends were taking it.

Both students and administrators thought that some of the least important reasons were "because it pertains to their hobby," "there is no home work," "no other classes to choose from," "it was the parents' wishes," and "prepared them for technical school."

Approximately 17 times as many students selected the first reason, "I like to work with my hands" as those who said "the counselor recommended it." Junior high administrators thought the counselors recommendations were more important than students and senior high administrators. Junior high administrators ranked this 6.5 from a list of 14. The senior high administrators ranked it eleventh.

Trade and industrial

The main reason students select the program is to "prepare for a vocational or technical school." The second reason is to obtain a good background for college entrance;

however, the largest number of students indicated they were going to college after graduation from high school.

Only two per cent of the auto mechanics and none of the students in the other seven course groups indicated they registered for trade and industrial courses because of recommendations by the counselor. However, administrators of trade and industrial programs ranked the counselor about in the center of the list of reasons. In contrast to the actual part counselors play in the students registering for the course, as given by the students themselves, industrial management indicated in their opinion students should be selected for trade and industrial courses on the recommendations of the counselor.

Program Effectiveness in Meeting Student Needs

Industrial arts

Students believe the program is best for "meeting their needs in the manipulative skill area" followed by "exploration to help determine a future occupation." In their opinion the program was of least value in "providing information about industrial processes."

Today's occupations are continually requiring an increased knowledge of material and processes. Materials and processes are becoming more complex and workers with this type of knowledge are more in demand. Students, however, did not believe the industrial arts program was meeting their needs as well in these two areas as in the area of manipulative skill.

Additional support to the students statements pertaining to how well the program is meeting their needs is provided by their response to the question of how satisfied they were with the course. Along the same line as obtaining manipulative skill was their opinion that making projects was the part of the course with which they were most satisfied.

They were least satisfied with the opportunity they had of applying in a practical way the facts they were learning in other courses, such as, physics and chemistry. This is one of the objectives industrial management thought most important.

Trade and industry

To meet students' needs, course objectives must be established in accordance with students' future plans and what use can be made of the course. With the exception of auto body, most students indicate that their plans are to go to college; yet, most students in trade and industrial programs do not see the trade and industrial course as preparation for college. All course groups in the state, except drafting, said the main purpose of the trade and industrial program is for "preparation for vocation or technical school." They selected "college preparation" as the lowest of the reasons for the course. Drafting students selected "preparation for employment" as the lowest and "college entrance" as the main reason for the course.

Students believe the programs should be for students with one type of goal, while they themselves register for the course with another type of goal in mind. This makes it difficult to set up a program designed to meet the needs of the student. A trade and industrial course has not been intended to be a college preparatory course; yet, 72 per cent of the drafting, 68 per cent of the electronics, 65 per cent of the welding, 42 per cent of the carpentry, and 35 per cent of the vocational metals students stated their intention of entering college during the first two years following high school graduation.

Industrial arts courses have as objectives general knowledge desirable for any high school graduate. Three hours for trade and industrial programs cut deeply into the time of a college preparatory program; yet, the majority of the trade and industrial students stated they were taking an industrial arts course in addition to the trade course. In most cases, these industrial arts courses were in the same field as the trade courses.

Physical Facilities

Industrial arts

Approximately 50 per cent of the parents of both the junior and senior high school stated that classroom, shop space, and equipment were good. Approximately 250 parents stated they had not had an opportunity to observe, indicating a large number of parents do not visit the school's industrial arts facilities. "Proper ventilation and dust removal" was the lowest rated by parents and was one of the lower ratings by students. Students rated "facilities for movies and film strips" the lowest, followed by "storage for projects." "Lighting" was rated best by students followed by "condition of power tools and equipment," and "safety devices, rules and regulations."

Thirty-three per cent of the junior high school and 31.7 per cent of the senior high school students said this condition was poor. Project storing appears to be inadequate at both the junior and senior high school level. At the senior high level, 26 per cent of the students said storage for projects was poor.

As indicated by the responses, the project is the major vehicle of instruction in the majority of the state's industrial arts courses.

Administrators believe increased industrial arts offerings should be made but indicate "lack of funds" and "lack of facilities" as the main reasons they are unable to do this. Funds are, of course, required to improve or add facilities.

Trade and industrial

Conditions vary from program to program as do the specific needs of various programs. Several conditions, however, were noted "poor" by the students in most schools. These conditions were facilities for movies and film strips, dust removal, ventilation, storage for projects, and storage for materials.

During the visit to the schools to complete the program evaluation instrument, "storage for supplies, materials, and small equipment," and "provisions for movies, etc." were noted unsatisfactory for 32 per cent of the programs. During these evaluation visits, "proper ventilation and heating" was noted unsatisfactory only 7 per cent of the time while 46 per cent of the programs were rated superior. The students, however, considered ventilation one of the poor conditions.

One of the conditions noted during the visits was the lack of reference libraries within the various program areas. This condition was unsatisfactory in 28 per cent of the cases, while it was only superior in 11 per cent. Along this same line, 28 per cent of the programs were rated unsatisfactory to the item "students made frequent use of available reference materials," while 18 per cent rated it superior.

Proper lighting was rated superior 36 per cent of the time during the visits, and unsatisfactory only 14 per cent. Students also rated lighting good, but they did not rate natural lighting as high as artificial.

In many cases (29%), the space did not appear to be well adapted to the activity, nor was it well utilized. Utilization was unsatisfactory for 21 per cent of the programs. Students, however, considered shop and class space good. Students considered class desks good, but shop work benches were poor.

Relationship of Program to Anticipated Employment

Industrial arts

Students at the junior and senior high school levels selected from a list of 12 purposes, "to help students select an occupational field," as a prominent objective. This places an exploratory value on the program to help students decide a field to pursue for future employment.

The exploratory purpose was selected by nearly three times as many students as "to help students get a job when they graduate."

Only 3 per cent and 7 per cent of the junior and senior high school parents, respectively, indicated their sons were intending to seek employment after graduation, and only 4 and 13 per cent, respectively, indicated intention to register in a trade and technical program. The majority of the parents believe their sons will attend a college or university.

Trade and industrial

Fourteen per cent of the total trade and industrial students indicated they were expected to get a job in the same field as the course they were taking. Twenty-three per cent said they took the course to prepare for the engineering program they will take in college, and twenty-three per cent said they thought the course was for trade or vocational school.

As indicated by their first two year plans following graduation, students were not planning to use the course to gain employment. This was one of the least selected choices. Entrance to college or university was selected the most, followed closely by attendance at a trade or vocational school. The trade and industrial program has as its primary function, the preparation of students for vocational school; yet, a larger number of students taking the course plan to attend a college or university than any other choice.

Assignments and work methods appear to be based on similar work done in industry as indicated by the fact that only 7 per cent of the programs received an unsatisfactory rating on this point while 36 per cent were superior. Machines and equipment, however, do not meet industrial standards and 32 per cent received an unsatisfactory rating, only 22 per cent were superior.

To prepare students for anticipated employment, a vocational program must place emphasis on speed of production, but only 36 per cent of the programs were rated superior on this item. There were 11 per cent which were rated unsatisfactory.

In order to determine adequately the actual relationship of the program to anticipated employment of the student, advisory committees must be in existence and functioning. Advisory committees obtain and maintain public interest and support and aid in establishing guidance for the selection of students for the program. They are able to relate industrial needs to the program.

In the state of Utah, advisory committees for secondary trade and industrial programs were virtually non-existant at the time this study was made.

Selection of Students for Programs

Industrial arts

Administrators and counselors indicated that it is not a general policy for them to arbitrarily place or assign students to industrial arts classes. Some of the administrators stated that on occasions students were in industrial arts classes because there were no other classes available to the student.

The industrial arts teachers also stated that, in general, students are not arbitrarily placed in an industrial arts class.

Trade and industrial

Sixty-five per cent of the respondents from industrial management indicated that the selection of students for trade and industrial classes should be based on the recommendation of the high school counselor. Fifty-two per cent believe that some type of aptitude test should be used to aid in the selection of students.

Less than 50 per cent of the parents indicated that the industrial arts courses provided an opportunity for students to solve real problems that arose from other classes. However, almost as many stated that they did not know if such opportunities were provided for the students.

Slightly over 50 per cent of the parents indicated that the industrial arts program could be improved if there were more cooperation between industrial areas and other courses such as physics and chemistry.

Eleven per cent of the students indicated that the industrial arts teachers worked with the science teachers in applying practical application of scientific principles. More than 50 per cent stated that they did not know whether or not the industrial arts and science teachers worked together. Almost 75 per cent of the administrators and counselors indicated that there could be a correlation between course content of the industrial arts and science programs.

The majority of the industrial arts teachers were of the opinion that their administrators thought the industrial arts programs were good or excellent.

RECOMMENDATIONS

1. A concerted effort should be made by the industrial arts teacher to relate the industrial arts course content to the subject matter in other areas of the school. For an example, industrial arts teachers and science teachers should work together in providing application of scientific principles.

2. Industrial arts teachers need to provide students with a clearer picture of the objectives of industrial arts, and the contributions industrial arts has to make to their general education.

3. More emphasis in industrial arts courses should be placed on the content area of dealing with information about industrial materials and processes and occupational opportunities. This need is recognized by junior and senior high school students.

4. In planning new industrial arts and trade and industrial education facilities and in remodeling existing facilities more emphasis should be placed on providing provisions for the following: showing of films, more space for project storage, better ventilation and dust removal systems, and an increased amount of test equipment.

5. It appears that a large percentage of both junior and senior high students take industrial arts courses for occupational reasons. This being true, industrial arts might very well become more occupationally oriented especially at the senior high level.

6. It appears that students in industrial arts courses at the junior high school and also the senior high school think that industrial arts courses make very little contribution

to the professions that require degrees. If more emphasis toward these professions is desired, then some changes will need to be made in content, teaching and the general overall approach to accomplish this.

7. According to both the students and the parents, industrial arts is being taught from the point of view of skills in occupational preparation. Therefore, a greater emphasis should be placed, in industrial arts courses, on information about jobs and industrial technology if industrial arts is to remain a part of the general education program.

8. The purposes and objectives of industrial arts and trade and industrial programs must be more adequately stated, and ways devised whereby they will be better understood by all concerned before any program of industrial education can function properly.

9. A better understanding between industrial education teachers and their administrators as to the purposes of industrial education and also the students that should be enrolled in these programs must be achieved before the programs can be of maximum value.

10. Students in trade and industrial education courses must be fully informed and cognizant of the fact that these courses are designed for employment rather than for professional preparation. If the student is realistic in his desire to go into professional preparation after high school, he should be enrolled in an industrial arts course rather than a trade and industrial education course.

11. More adequate course planning must be provided before quality industrial education programs in high school can be attained.

12. It appears that trade and industrial courses emphasize manipulative skill development and little effort has been made in these courses toward providing learning opportunities in the areas of how to apply for a job, fringe benefits of workers, union management relationships, communicative skills needed in industry, etc. It is, therefore, recommended that a new look at the trade and industrial education course content be taken in light of items other than only skill development.

13. A more nearly adequate selection of students for trade and industrial education courses must be made so that those students who definitely plan to enter college following graduation are directed into college preparatory classes to make room for those students who do not plan to enter college but rather plan to enter employment or further post high vocational-technical training.

14. It is recommended that appropriate industrial arts courses be a prerequisite to all trade and industrial courses offered in the high school.

15. Since 50 per cent or more of the trade and industrial education students are also enrolled in industrial arts courses, some future study must be made to find out the value or lack of value of this. This is undoubtedly hindering students from taking other courses that could broaden them.

16. Clarification to parents must be made as to the purpose of trade and industrial education courses. A large per cent of them think that their son should go into one of the professions (requiring a degree) but also feel that their son should take a trade and industrial education course.

17. Trade and industrial courses should not be considered as elective courses as other

general education courses are, but a very carefully worked out screening process and vocational guidance system to attempt to place only those students into these courses that can benefit from such training. It is just as much a fallacy to have definite college bound students in vocational trade and industrial programs as it is to have students who are definitely not going to college in college preparatory programs.

√ 18. It is recommended that no trade and industrial education program be established without the recommendation of appropriate type advisory committees, and that advisory committees be maintained for all crafts.

√ 19. If trade and industrial programs are important and needed at the high school level, they should be scheduled as part of the regular school day rather than on an extended day basis. This penalizes a student who is enrolled in such a program.

20. A more concerted effort must be made with regard to developing, coordinating, and using adequate courses of study. The advice or council of the advisory committee for each craft should be fully utilized in this regard.

21. Trade and industrial education teachers should make a concerted effort to develop an adequate reference library and should encourage their students to make maximum use of the material.

√ 22. Sound economics require the utilization of industrial arts facilities for trade and industrial courses, however, it is recommended that these facilities be remodeled and re-equipped for the trade and industrial course inasmuch as industrial arts facilities are not adequate for trade and industrial programs.

23. It is recommended that trade and industrial education teachers provide their students with a clearer picture of the objectives of trade and industrial education, and the contributions their programs can make in preparing a person for employment, and to his future position in society.

24. The implication for vocational and/or occupational information counseling is very strong. The "counseling" should not be a separate situation but incorporated into the industrial arts and trade and industrial programs. It should be part of the course of study.

25. In the industrial arts and trade and industrial programs of the latter part of the senior high school, information regarding technical, vocational, apprentice programs should be provided for the student so that he may investigate and understand the available paths other than collegiate, professional training.